SELECTIONS

FROM

THE RECORDS

OF THE

MADRAS GOVERNMENT.

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No. I of 1854.

NAVIGATION

OF

THE GODAVERY.

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1856.

Civil Engineer's Office: Godavery Division, 29th December 1853.

No. 474.

FROM MAJOR F. C. COTTON,

Civil Engineer Godavery Division.

TO THE SECRETARY TO THE BOARD OF REVENUE,

Department Public Works, Fort Saint George.

SIR,

1st. Since I received instructions to examine the Godavery, and ascertain the practicability of navigating it, I have made several expeditions up the river, and gained much important information; which will I trust be acted upon, without waiting for the more complete report that cannot be sent in, till after the hot season; as till then, I shall not be able to have any portion of the river's bed levelled.

2d. I have already reported, that on receipt of the Extract from the Proceedings of your Board, giving me information that 10,000 Rs. had been sanctioned for the exploration of the Godavery, I immediately sent Mr. Tuke up the river, to examine as much of the bed as he could, while the water was at its lowest.

3d. The report of his expedition has been sent to you: it contained much useful and accurate observation; and the rough sketches he then made, and the knowledge he had gained, were of the greatest use to us in our subsequent voyages in that part of the river which he had examined.

4th. I have also reported to you the passage of the Pottinger Steam-Tug to Enchampilly, (200 miles above Dowlaiswaram) her detention there, and also her return. Mr. Tuke's log of that expedition is now forwarded.

5th. Since that time I have been twice up the river in a very small steamer (the " Grenade") fitted out at Dowlaiswaram by Captain Hutchinson. On the first occasion her shaft broke, about 120 miles up the river; and on the 2d excursion, which was in the beginning of November, I found the passage through the rocks above Badrachellum so intricate, that I could not take the steamer above them, and was obliged to return.

6th. While the Pottinger was on shore at Enchampilly, I went up the stream, and examined the last rocks that are met with between Dowlaiswaram and the mouth of the Wurdah. I was induced then to return to the Delta; and Mr. Tuke in my absence visited Mahadeopoor, and Chinnoor, a town of some importance on the left bank of the Godavery, above the junction of the Wurdah.

7th. As before reported, I sent an empty cargo boat up the Godavery, before I left Dowlaiswaram, with no better means of working her, than those in general use in the Delta ; my object being to test the practicability of navigating the river without the use of steam. This boat reached Chinnoor between the first and second freshes, and might have brought a cargo to the coast, had one been purchased for her.

8th. In these voyages we have learnt much of the character of the river, both in the driest month of the year, and also in the season of fresh. Indeed it so chanced, that in our first voyage in the Pottinger, we were met by one of those extreme freshes which only occur occasionally. We have now a knowledge from actual observation of the obstacles to navigation that are to be met with, from the sea to the borders of those districts, which produce amongst other valuable articles for export, the cotton so well known as " the cotton of Berar." We have established an acquaintance with the people on both banks of the river ; have learnt much as to the condition of the districts passed through ; and have seen how anxious the inhabitants are for the means of communicating with the coast, and how ready they will be to aid us in our future operations.

9th. I need not do more than refer to the subjoined plan of the Godavery (marked A,) to show how favorably its branches are disposed, to form a system of water communication for those rich and extensive tracts in the Hyderabad and Nagpore countries, which have now no better outlet for their produce, than the rough paths and steep passes, that lead through the western ghauts to the port of Bombay. Had the branches been laid out artificially, and the main stream been cut as the Trunk line, nothing could have been more perfect as a system of inland navigation, from the cotton fields to the only harbour of the eastern coast.

10th. The straightness of the Godavery is one very remarkable peculiarity in its course : there are only 3 or 4 abrupt turns between Chinnoor and the sea, and none of those tortuous windings, that render the navigation of many rivers difficult and dangerous.

11th. As far as we have the means of judging, the slight fall in the bed of the Godavery is no less remarkable than the straightness of its course. My Aneroid observations prove only that the slope is very small ; but the daily variation being at times equal to 100 feet of elevation, while the whole height to be measured is probably less then 250 feet, the Aneroid does not enable me to speak with confidence as to the actual change of level. The Aneroid observations of the Pottinger whilst at Enchampilly, compared with those registered at Rajahmundry, (vide enclosure B) will give some idea of the comparative altitudes of the two places ; but the distances between the stations, and the exceeding difference between the climates of the countries, render them of little value as a test of the change in elevation.

12th. The current gave us the means of judging of the fall; but from our want of speed we could not test that, going up the river. In coming down we had better opportunity; but in the distance between Enchampilly and Doomoorgoorum (the first 80 miles,) no accurate observation was made, from the watch on board the Pottinger being injured. From Badrachellum to Roodrumcottah the time occupied was 2 hours; the distance, 26 miles; which gives a total rate of 13 miles; from which has to be deducted $4\frac{1}{2}$ miles an hour, the speed of the Pottinger through the water. The current therefore in that part of the river, at the height of a high ordinary fresh, (then 70 feet deep,) was $8\frac{1}{2}$ miles an hour, indicating a surface fall of about $1\frac{3}{4}$ feet; and this was the greatest velocity of current met with. The breadth between the banks of the Godavery varies from 3 miles to 30 yards; but it's most general breadth is between 1,000 and 2,000 yards. As the water falls, the stream, as in all Indian rivers, is confined to a winding channel amongst sand banks; excepting where it's passage is through a hilly country, or a reef forms a backwater above it.

13th. The banks vary in height from 30 to 100 feet; a great portion of them being from 60 to 70 feet above the summer level of the water. Excepting in the hilly tracts, or where an occasional isolated hill comes upon the river, the banks are all alluvium; high near the river's edge, falling from it, and forming hollows, at distances varying from 100 yards to many miles, according to the undulations of the country. From each of these hollows, which are all flooded by the Godavery in its freshes, there are many drains cut down by the receding water to the bottom of the river, that become rugged gullies from 40 to 100 feet in depth.

14th. The navigation of the Godavery during the freshes, and in the hot months, must for the present be treated as two distinct questions; and I will first speak of the use of the river from June till November; during which months it has a greater or less supply of water from the S. W. monsoon.

15th. Of the value of the river at that season we have an actual proof in the passage of the cargo boat; and to show this clearly, I cannot do better than give a detailed account of her voyage to Chinnoor.

16th. The cargo boat (60 tons) left Dowlaiswaram on the 21st June. She went up the river by the aid of ropes and poles. She was provided with a sail; but the S. W. monsoon was a foul wind for her, nearly the whole way. She was manned by common lascars, one of whom was considered the Captain. She had no pilot, as none was to be had; and no one of the men understood the management of a boat amongst rocks.

17th. In her passage up the river she was met by the extreme fresh of July, which not only added greatly to the strength of the current, but by rising

higher than is usual on the banks, made tracking more difficult, frequently indeed impossible, from the trees extending into the deep water.

18th. In various ways this extreme fresh was against them: yet they made good their passage so early in the season, that the boat might have had a cargo on board, and been again at Dowlaiswaram before the second fresh of the season was at its height. Had there been a cargo ready, she would have taken it on board at Chinnoor, and delivered it in Cocanada in less than a week, without shifting any part of it on the passage.

19th. Not knowing the point she would reach, nor having any acquaintance with the merchants of the interior, no cargo was ready for her on her arrival. I had returned to the delta, Mr. Tuke was very unwell; and when he sent a messenger to see if a cargo could be purchased, everybody expected to make a fortune by us. An exorbitant price was asked for the cotton and other produce; and high transit duties was imposed, amounting, at one of the several Sayer stations to be passed, to 35 per cent upon the value of the goods. Mr. Tuke recalled the boat, and brought her down the river with the steamer.

20th. The cost of this boat's voyage up was 150 Rs.; she would have returned loaded in from 4 to 7 days; and the cost on that account would have been 15 Rs. more, to the port of Cocanada. The actual cost of carriage by her for the whole voyage, (as she went up empty) would have been rather less than 2 pice per ton per mile; and supposing such a boat to make only one trip a year, the cost would be as follows:

	Rs.
Cost of a teak boat of 60 tons	1,000
Interest at 5 per cent	50
Wear and tear of boat, 10 per cent	100
Passage up the river to Chinnoor	150
Return	15
Wear and tear of poles, sail, &c	30
Loading and unloading and sundries at 1 anna a ton.	20
Total	365

365 Rs. for the carriage of 60 tons,
300 miles = 4 pice per ton per mile.

21st. Had this vessel been worked by men acquainted with the river, and the management of a boat where there are rocks in the stream; had they made the passage in company with other boats, so that their crews could have combined their strength where the greatest difficulties were met with, she would have made two complete voyages at least, and might very well have reached Chinnoor a third time, ready for an early voyage down at the beginning of the next season.

22d. We need not however calculate upon the boats being out of work during the dry weather; for employment would be found for them either in the Delta, or between Badrachellum and the sea, or in those parts of the rivers which are navigable nearly the whole year, though at present cut off from each other by rocky barriers during the summer months. When at Chinnoor, the cargo boat was within 3 days' journey, for a bullock-bandy, of a cotton depôt, Jaunghaum, in which a large supply was stored, ready to be sent to the western coast when the monsoon ended. The cotton had still some months to lie there, and its transit would have occupied two months more. The cost of carriage would have been at least 55 Rs. a ton greater to the port of Bombay, than to the port of Cocanada; and the saving of time in reaching a shipping-port would have been about 4 months.

23d. A profitable trade may be opened at once on the Godavery; of that there can be no longer a question; and my enquiries in the interior enable me to speak with confidence of the Wurdah being navigable at the same season to near Chandah, which is 100 miles above Chinnoor, in the great cotton country.

24th. In confining my account of the advantage to be derived from the navigation of the Godavery in the freshes to the town of Chinnoor and Chanda, I must not be understood to say that there is no trade in the country below them. The Godavery passes through a naturally rich country: the whole way from Rakapilly westward, there is a succession of villages on either side, rarely more than a mile apart. The country is full of valuable products, now worthless from the high cost of carriage; and if, throughout this portion of the river's course, there was no demand for any other import from the coast, there is a cry every where for salt, which, even at Badrachellum, a town half way between Rajahmundry and Chinnoor, is sold wholesale, cent per cent upon our monopoly price.

25th. This want of salt gave every where an anxiety for our success; and those who knew nothing of trade, or what else to hope from the navigation of the river, one and all enquired whether we would bring them salt.

26th. Several other articles are also looked for with eagerness in the larger villages; such as cloth, cotton thread, salt fish, tobacco and cocoanuts.

27th. Satisfactory as the passage of the cargo boat must be considered, it is clear to me that in looking to the traffic that is about to open on the Godavery, we must reckon upon steam being used almost entirely; and I feel certain that by the use of steam power, the river will be worked far more cheaply than without it; wood for fuel being procurable up the river at half a Rupee a ton: indeed, looking to the results of steam navigation on the rivers of America, we may say with confidence that it will be so. The cost there, with the vastly greater expense of labour and low value of money altogether, is now only one pice a ton a mile: when introduced here and used as skilfully, it must be less than that.

28th. There are many reasons why steam will be adopted here. The cost of carriage in the Delta is still much higher than it ought to be, from want of boats: the demand is still increasing, as is the demand for timber and artificers for other purposes. Building boats will proceed but slowly; and could it even be pressed on faster, we should find a difficulty in manning them; the number of boatmen being very limited.

29th. By the use of steam the traffic will be more independent of the Zemindars and others on the river, who have hitherto considered every man within the limits of their districts as sent there for their benefit, and have never thrown away the gift, when they had the power to turn it to account.

30th. Till the boat people become accustomed to the climate, they will suffer much from ague on the tracking voyages; as was experienced by the party on board the Pottinger and cargo boat, during this tedious and laborious passage; that disease being evidently produced by chill, either from exposure to rain, or when wading in the river.

31st. In making my suggestions, therefore, for the immediate improvement of the river; though I shall not omit such as will remove the impediments in the way of tracking; I shall make it my chief object to render the stream safe and practicable for steamers of large dimensions.

32d. There are four rocky reaches between Chinnoor and the sea, that even in the intervals of the freshes become rapids, in which the current is strong, and the passage dangerously intricate for navigation with large or heavily-laden boats. This year the passage through them would have been dangerous for such vessels, for three weeks or a month.

33d. The highest reach is between Goomoolcondah and Talagoodium; the second 70 miles below between Panacherla and Doomoorgoorum; the third, which has already a tolerably direct passage through it, is between a small village (2 miles below Doomoorgoorum) and Chintral. The fourth is immediately above the town of Badrachellum.

34th. The first of these was slightly improved by Captain Fenwick; but a great deal more is required than was attempted by that gentleman.

35. The upper reef is still almost continuous across the Godavery, when the river has fallen to the lowest monsoon level. This reef is just above the junction of the Indravatty. Below, the river is rock-bound on both sides; and for a distance of 8 miles more or less blasting will be required to clear a good monsoon passage. The rock is in slaty reefs occupying in places nearly the whole breadth of the Godavery: some parts of this reach are free from rocks and very deep; but while I was at Enchampilly, as the water fell, fresh reefs became exposed from day to day.

36th. The removal of this rock will be done at a trifling cost, and we must shatter all we can of it in the dry weather: there can be no doubt that a good monsoon passage can be made by this means only; but I think it probable that it may be found advisable to avoid the reach by a canal, when more complete improvement in the navigation is attempted. But even if that is done, the river will be used when the water is high enough, that is, one third of the whole year; so that nothing which is now spent will be lost.

Goomalconda Reef;

50 × 100 × 5 = 25,000 cubic yards at 2 annas = 3,125 rupees.

Reefs in the reach below;

500 × 30 × 5 = 75,000 cubic yards = 9,375 rupees.

Total rupees......12,500.

37th. I cannot now say that this part of the Godavery may not be completely opened by blasting. It is the most unpromising part of the river, as I saw it; but in the dry weather we shall be able to judge, and if there is no hope of clearing it so that a reasonable supply of water will keep it navigable, I will suggest other means to correct the fall during the summer months.

38th. The Doomoorgoorum rapid is three miles in length; but in the upper two miles the points of rock are far apart; and there is already a tolerably well-defined passage through them. In the last mile the passage is more intricate, and the rocks more crowded. I do not now, however, propose to open this passage, but to cut through a part of the barrier where the rock is at present more continuous, but the breadth to be cut through very much smaller.

39th. If we could undertake it, I would recommend the entire destruction of this barrier by a broad and deep channel through it; but we cannot do this next season; and I propose only to shatter the rocks most in the way, which will clear the passage without materially affecting the level of the bed above. The immediate expenditure I propose here is as follows:

1,000 × 25 × 5 = 125,000 at 2 annas = 15,625 rupees.

Scattered rocks = 20,000 „ „ = 2,500 rupees.

Total......145,000 cubic yards.

Total rupees......18,125.

40th. The present passage through the Chintral barrier is one direct line; but there are some dangerous rocks in it, that ought to be removed, which may be done at the following cost:

30 × 20 × 6 = 3,600 at 2 annas = 450 rupees.

From Mr. Tuke's account of the fall in the reef, and its position with regard to Doomoorgoorum, I think it highly probable that we may have to throw a weir across the river here, and overcome the fall by locks; but this can only be determined when the necessary levels have been taken.

41st. The passage through the Badrachellum rocks becomes intricate when the river is low; but between the freshes, the rocks are not so crowded as to make them dangerous to steer through, with a steamer. The passage, however, could not be considered safe at all times for a laden cargo boat; and the following sum ought if possible to be spent upon it this season—

$250 \times 50 \times 5 = 62{,}500$ cubic yards at 2 annas $= 7{,}812\frac{1}{2}$ rupees.

42d. In addition to the work above suggested, I would recommend the immediate removal of some detached rock met with, here and there, in the bed of the river; but there are only a few that I think we need take into our consideration this season. For this purpose I would say—

$30 \times 20 \times 10 = 6{,}000$ cubic yards at 2 annas $= 750$ rupees.

43d. There is another impediment to the navigation during the season of freshes, that renders the river somewhat dangerous for about 14 of the best working days in the year. This is the whirl or confused current at Kutchaloor, which is caused by two sharp groynes of rock that jut out of a spur, in the outer curve of a sharp turn in the stream. These are undoubtedly the cause of the dangerous confusion in the currents; and if powder enough is spent on it, I feel certain that it can be entirely removed: I do not expect to do all that is necessary here this year; but I hope I may be able so to alter the form of the spurs, that the confused water shall not extend to the centre of the stream.

Work for the season,

$2 \times 20 \times 50 \times 25 = 50{,}000$ cubic yards at 1 anna $= 3{,}125$ rupees.

This will be broken down cheaply by large blasts, and the stone will fall into very deep water.

44th. The works above proposed for this season are such as I have hopes of being able to execute. They may complete nothing; but they will materially benefit the navigation, enable our future works to proceed more rapidly, and show to those who are inclined to use the river that we are actually engaged in its improvement. And, as far as the expenditure goes, it will all be well laid out, whatever may be done to complete the navigation of the Godavery.

45th. Small as these operations may appear for the work of a season, they are as great as I can hope to carry out before July next; and their effect in various ways will be of the greatest importance. By them we shall not only render the navigation secure during the monsoon, but we shall also improve our acquaintance with the people, and teach them what the greater portion have to learn, viz. that the circar work is not to be done by forced labour, or for a nominal payment. And if I have even this much done while I am completing my examination of the river, the navigation will be advanced one whole year.

46th. Till my knowledge of the actual levels of certain reaches is more accurate, I am obliged as I have before said, to consider the navigation of the river during the monsoon and the dry months, as distinct questions.

47th. The river in the summer is divided by the rocks into three parts; one extending from Dowlaiswaram to Badrachellum, about 100 miles in length; another from Parasala to Tallagoodium, about 80 miles; and the third from Goomolconda immediately above the junction of the Indravatty to Chinnoor on the Godavery, about 40 miles, to which may be added about 60 miles more on the Wurdah, below the rocks at Alah.

48th. Of the space below Badrachellum I have good information; and I think I can safely say, that it can be kept open the whole year, by the removal of a few rocks here and there, and the use of Bandhals, such as are employed with good effect on the rivers of Bengal.

49th. From the information given to me regarding the fords and ferries on the river, I feel sure that the other portions might be kept open by the same means; and they are of sufficient length to make it well worth our while to keep them open, even before they are connected; but I am not prepared to undertake their management this season.

50th. I propose this year to confine my operations for the summer navigation to the river below Badrachellum; a space of itself of sufficient importance to justify the outlay of a much larger sum than has ever been spent on the most finished of our western ghauts. There is no pass on that coast of our Presidency which has so important a terminus as the point to which this navigation reaches. The field to supply traffic for the line is infinitely greater; and the cost of carriage afforded by the river will be about $\frac{1}{24}$ of the reduced rate of our best western road.

51st. As the first step towards the improvement of this portion, I have only as yet mentioned an expenditure of 3,125 Rupees for correcting in some degree the confusion of the stream at Kutchaloor. The following expenditure will be advisable to facilitate the summer navigation:

Cutting the jungle and making a towing-path through the Koloor Gorge.

Cutting jungle 4 miles between the high water mark and the summer water line, 40 yards, 600 Rupees.

Making a practicable path-way for 4 miles on the rocky hill side at 300 a mile, 1,200 Rupees.

The removal of detached rocks at Wadagoodium, Komarum and other places, 400×20×5=40,000 c. yds. Rupees 2,500.

52d. For the season, parties must be located at the principal shoals, to erect, keep up, and alter Bandhals.

	Rs.
At each, 1 Maistry	10
20 Men at 4 Rupees each	80
	90

From February to June inclusive.

90×5=450 Rupees.

10 Bandhals...10×450=4,500 Rupees.

53d. For the management of these Bandhals I shall require two intelligent and well-paid superintendents, who will each have 50 miles to travel over. Where I can obtain suitable men for this work I do not know. I can ill afford to spare any overseers; and if I could, there is but one who can speak the language well enough for such employment; and he is too well occupied where he is, to be moved from the delta. I cannot estimate their management for the five months at less than 500 Rupees.

54th. This description of work is altogether new to us; and we must serve an apprenticeship, before we can hope to make them work as effectually as they are made to do in Bengal. It is on this account the more necessary that we begin at once.

55th. Another expenditure, which I consider immediately necessary, is the sum required for fitting out a steamer capable of going through the water at 10 or 11 miles an hour.

56th. Such a steamer is required for the examination of the Godavery and its branches above Chinnoor, and for the protection of the traffic. Such a vessel will for many years be advisable; and while it serves that purpose, it will find constant employment in keeping up a communication between our frontier stations and the coast. Had I had a good steamer this year, I might have made at least 8 voyages to Chinnoor, had I got no further; but I should as certainly have visited Chandah, and examined the Wyne Gunga and Godavery. I should have saved the whole expense of my voyages by the carriage of those stores which have now to be sent by land from Masulipatam to Nagpore and Saugor; and I should have conveyed one or perhaps two Regiments over a space of at least 300 miles. Such a steamer as I require would cost about 30,000 Rupees. When Colonel Cotton first agitated the subject, and asked permission to explore the river three years ago, he sent to Messrs. Forrester and Co. in Liverpool, to warn them that a vessel would be required for use on the Godavery. They undertook to make one which should draw 16 inches and go at least 10 miles an hour, with an engine of 25 horse power. Such a vessel has I understood been prepared; but as the proposed examination of the river was not taken up at the time, no engine was made for the boat.

57th. I would now earnestly recommend, that Messrs. Forrester and Co. should be instructed to send out the hull and all that is necessary to complete the steamer they projected, with as little delay as possible. If the hull is indeed ready, we might even now have it put together in time to use it, during some part of the next year's freshes. While we are completing the boat, the

engine and boiler might be prepared and sent out; and by this time next year, we might have explored several of the principal branches of the Godavery, and be navigating the river with tools, and salt, and stores, between Badrachellum and the sea.

58th. As far as I have seen or learnt the character of the Godavery, there is no reason why the navigation should not be made as perfect as we please. There is still a possibility of our being able to reduce the falls in the bed of the stream, so that by an artificial supply of summer water, it may be kept open without weirs all the year through; but it will more probably be found advisable to reduce the fall by weirs; in which case sites may always be chosen where materials are close at hand; the worst rocks in the river supplying the very best material for correcting the slope.

59th. There is one great obstruction to the traffic on this line of communication, which cannot, I am sorry to say, be removed by any blasting powder; and that is, the exorbitant transit duty threatened by the Zemindars and others. I say threatened; for with the exception of timber, there is at present almost no traffic on the Godavery, from district to district; and therefore no considerable amount of duty is collected. The lawless and extortionate demands made on the river, where, there being no choice of routes, they could not be evaded, have, from time immemorial, closed the Godavery against all distant traffic.

60th. Between Dowlaiswaram and Chinnoor, transit duties will be demanded at Palaveram by the Company's Government; at Woodagoodum by the Rakapilly Zemindar; at Badrachellum, or Mungapett, by the Badrachellum Zemindar; and at Nagaram or Chinnoor by the Ramagherry Circar. And had our boat received a cargo from Jaunghaum, another duty was threatened there.

61st. The Company's demand is from 3 to 5 per cent on the value of goods passing the frontier; and the collections on all that passes the Chouky on the Godavery, which is at Gootala, amount to 5,400 Rupees a year, 2,600 of which is on timber and bamboos; the remainder being on the very few articles carried up the stream.

62d. Till lately a transit duty has been collected by one of the Rajahmundry villages in the hills; but this was a decided robbery; and on a warning from the Collector, the Reddy's demands are made more timidly, and they will cease altogether when we have a steamer on the river.

63d. The Rakapully Zemindar seems for many years to have had a right to some very slight "Roosum" on timber rafts passing the mouth of the Severy; but of late years, he has increased this to a heavy transit duty on all goods; so heavy on salt fish and other common-coast produce, that

nothing is now carried by water above Woodagoodium; and Sooda Reddy has thus the advantage of a monopoly sale.

64th. It is admitted by every one that this was illegal; and on my questioning the Zemindar's Naib at Badrachellum, "why a dependent was allowed to injure the country so severely," he said that, "while the Zemindary was "in so unsettled a state as it had been for some years past, with two families "disputing the possession of it, neither dare make an enemy of the Rakapilly "Zemindar; and that he had taken advantage of the time to levy an exorbitant "toll."

65th. A list* of the tolls taken on the frontiers of the Badrachellum Zemindar is subjoined. In some of these nerricks there is a different tax for almost every article, and a different rate according to the country from which it is brought; a refinement which, with the semblance of a careful policy, has in fact no other object than the mystification of the rate, enabling the Collectors, as one of them explained to me, "to get what we can."

66th. Cotton is omitted in the only list sent, (which has but now reached me), probably because my chief enquiries, while in the country, were regarding that article.

67th. The rates in the Ramgherry Circar have not been sent to me, but the messenger to Jaunghaum was told that he would have to pay at Chinnoor 6 Rupees a bullock-load, or 33 per cent upon the price of the cotton. This doubtless was an attempt at robbery on a very large scale; but it serves to show the extent to which these dues will hamper the rising traffic on the river, if nothing is done to prevent it. Indeed, unless some great change takes place, it would be hardly possible to navigate the river to profit; since the detention of vessels at the several frontier stations would, in the present state of the river, be ruinous.

68th. I may, I trust, reckon with confidence on the Palaveram Choky being removed. And fortunately the whole of the districts from our frontier to Chinnoor are under the same Talookdar, "Goolam Nekka Khan" (if I read his name right); and it is so clearly to his interest to have an outlet for the produce of his talooks, that I cannot doubt that on the removal of our frontier Choky, he will arrange for the removal of all demands on the river within his limits.

69th. If this arrangement is entered upon at once, it will probably be made without difficulty; as the whole collections legal and illicit made on the Godavery now are, for the reasons above-mentioned, very trifling. And if it is argued that the goods which now travel parallel to the Godavery will hereafter be carried by water, and thus evade the duty, the answer is, that with the exception of salt, there is no considerable traffic between Chinnoor and the

* Marked C.

Eastern coast. And all the present trade will be found the merest trifle, when compared with the traffic, which will be carried on between the districts on either side of the Godavery, and the shipping ports upon the river. So that those who, from their poverty, are obliged to scrape together money from day to day, by this ruinous mode of taxation, or who have not the intelligence to know better than thus to cripple their resources, and render valueless a great portion of the produce of their districts, may still make their collections on the approaches to the river.

70th. It may appear that I am going beyond the province of an Engineer in entering upon the subject of the transit duties; but the necessity for an immediate discussion of the matter is my excuse. Had I loaded the cargo boat, and paid all that was asked, the charge per ton would have been 126 Rs.; while the cost of carriage in that experimental trip, calculated on the supposition that a boat made only one voyage a year, was but 6 Rs. a ton from Chinnoor to the sea. If the charge at the several stations, including Jaunghaum, but omitting Rakapilly (which I must consider as altogether illegal,) had been at one nominal rate of 3 per cent upon the value, the charge for transit duty would still have been at least four times the cost of carriage, or 25 Rs. a ton.

71st. My examination of the river is, as I have said, for the present delayed by the fever in the Rakapilly Hills, and the questionable state of the climate at the other places in the valley of the Godavery; of which we have, as yet, only very vague information. While in this doubt, I have not thought it advisable to send a party up the river; but by the end of January, I shall be able to proceed with my enquiries. I propose then to send Mr. Goddard of the Engineers to take the sections and levels I require; and I hope I shall, by that time, have sanction for the sums I have asked for the first improvement of the river; in which case I would associate Mr. Tuke with Mr. Goddard, in order that they may carry on the blasting and other operations, while the levels, &c., are being taken.

72d. As it is of great importance that we should establish the practicability of building boats up the river, where, from the low price of wood, they ought to be far cheaper than they are in the Delta, I am sending a party to the neighbourhood of Mahadeopoor, to construct a portion of those boats sanctioned for my Delta work.

73d. As I cannot doubt that we are now to set to work in earnest, to open the navigation of the Godavery, I may safely say that there is no part of the Presidency, in which a company of Sappers could be so well employed on civil duty. In the removal of rocks, elephants would also be of the greatest use to us; and if five or six could be spared for the purpose, they would greatly assist us in our work.

74th. Those who have read the interesting reports upon the Godavery and Wurdah by Captain Fenwick, will see that I have done nothing but confirm the leading facts established by that most energetic gentleman 30 years ago. The famous house of Palmer and Co., by his assistance, made use of the river for several years, to convey cotton to the Port of Coringa; and who can say how great changes would have been effected not only in the trade of India, but in the manufactures of England, if their enterprising efforts had been followed up. It is impossible to read the works of Messrs. Ashburner, Chapman, and all who have studied the subject of the cotton trade of late years, without admitting, (as indeed all have done, who have either written or spoken lately upon it, in the last 12 months) that cheap carriage from Berar to Manchester is, at the present time, the greatest of all commercial desiderata. It is evident, from recent enquiries, that a less reduction in the cost of cotton than will be effected by the use of water carriage from the interior to the coast, would give Berar a complete advantage over America. And as the extent of land suitable for its growth has been shown to be three times as great as would produce the quantity now imported into England, it may be said with safety that Manchester's independence of America now depends upon our activity here; and I cannot close this letter, without expressing my regret that several most valuable weeks have been lost already by myself; a loss which should not have occurred, had I not been in a state of health which unfitted me for business.

I have the honor to be,

Sir,

Your most obedient Servant,

F. C. COTTON, Major,

Civil Engineer G. Dn.

Rajahmundry District, Camp at Dowlaiswaram, 29th December 1853.

A.

Memo. of the works required for the immediate improvement of the River Godavery.

		Rs. A. P.	Rs. A. P.
	c. yd.		
Goomaconda reef	50 × 100 × 5=25,000		
	at 2 Annas per c. yd.	3,125 0 0	
Reefs in the reach below	500 × 30 × 5=75,000		
	at 2 Annas per c. yd.	9,375 0 0	
			12,500 0 0
Doomoorgoorum barrier	1000 × 25 × 5=125,000		
Scattered rocks	20,000		
	145,000		
	at 2 Annas per c. yd.		18,125 0 0
Chintral barrier	30×20×6= 3,600		
	at 2 Annas per c. yd.		450 0 0
Badrachellum rocks	250×50×5=62,500		
	at 2 Annas per c. yd.		7,812 8 0
Scattered rocks	30 × 20 × 10=6,000		
	at 2 Annas per c. yd.		750 0 0
Kutchaloor rocks	2×20×50×25=50,000		
	at 1 Anna per c. yd.		3,125 0 0
Cutting jungle 4 miles between the high water mark and the summer water line, 40 yards			600 0 0
Making a practicable path-way for 4 miles on the rocky hill side at 300 Rs. a mile			1,200 0 0
The removal of detached rocks at Wodagoodem, Komavarum, and other places.	400×20×5=40,000		
	at 2 Annas per c. yd.		2,500 0 0
Establishment required at the principal shoals to erect, keep up and alter Bandhals. At each, one Maistry ... Rs. 10 20 Men at 4 Rs. each ... 80 90 From February to June inclusive. 90×5=450 10 Bandhals 10×450=			4,500 0 0
			51,562 0 0
Superintendence, Sundries, &c., at 10 per cent			5,155 0 0
	Total C. Rupees...		56,717 0 0

FRED. C. COTTON, Major,

Civil Engineer G. Dn.

29th December 1853.

B.

Comparison between the Aneroids at Enchampilly and Rajahmundry.

No. 1 Aneroid at Enchampilly.

		Morning.	Noon	Evening
29th	July	29-312	....	29-325
30th	,,	29-312	....	29- 32
31st	,,	29- 28	....	....
1st	August	....	....	....
2nd	,,	....	....	....
3rd	,,	29- 2	....	....
4th	,,	29- 21	....	....
5th	,,	29- 2	....	....
6th	,,	29- 22	....	29- 2
7th	,,	29- 22	....	29- 18
8th	,,	29- 22	29- 25	29- 2
9th	,,	29- 2	....	29- 22
10th	,,	29- 18	29- 2	29- 18
11th	,,	29- 2	29- 19	29- 18
12th	,,	....	....	....
13th	,,	....	....	....
14th	,,	....	....	....
15th	,,	....	....	....
16th	,,	....	....	....
17th	,,	....	....	....
18th	,,	....	....	....
19th	,,	....	....	....
20th	,,	....	....	....
21st	,,	29- 21	....	29- 2
22nd	,,	29- 2	....	29- 18
23rd	,,	29- 19	....	29- 2
24th	,,	29- 2	....	29- 21
25th	,,	29- 2	....	29- 2
26th	,,	29- 22	....	29- 21
27th	,,	29- 19	....	29- 17
28th	,,	29- 1	....	29- 1
29th	,,	29- 1	....	29- 12
30th	,,	29- 1	....	29- 1
31st	,,	29- 1	....	29- 11
1st	Sept.	29- 15	....	29- 14
2nd	,,	29- 14	....	29- 18
3rd	,,	29- 2	....	29- 2
4th	,,	29- 2	....	....
5th	,,	29- 21	....	....
6th	,,	29- 25	....	....

Aneroid at Rajahmundry.

		Morning.	Noon	Evening
29th	July	29-530	29-575	29-500
30th	,,	29-525	29-550	29-480
31st	,,	29-500	29-525	29-480
1st	August	29-500	29-525	29-460
2d	,,	29-500	29-530	29-475
3rd	,,	29-525	29-550	29-500
4th	,,	29-510	29-550	29-465
5th	,,	29-500	29-540	29-430
6th	,,	29-475	29-500	29-415
7th	,,	29-450	29-475	29-410
8th	,,	29-450	29-475	29-435
9th	,,	29-465	29-510	29-425
10th	,,	29-450	29-500	29-440
11th	,,	29-450	29-500	29-430
12th	,,	29-450	29-490	29-490
13th	,,	29-575	29-600	29-500
14th	,,	29-525	29-550	29-425
15th	,,	29-500	29-475	29-385
16th	,,	29-410	29-465	29-400
17th	,,	29-475	29-525	29-450
18th	,,	29-525	29-575	29-500
19th	,,	29-525	29-575	29-450
20th	,,	29-475	29-510	29-375
21st	,,	29-400	29-415	29-315
22nd	,,	29-330	29-375	29-310
23rd	,,	29-310	29-375	29-325
24th	,,	29-400	29-430	29-370
25th	,,	29-460	29-500	29-400
26th	,,	29-425	29-455	29-380
27th	,,	29-400	29-430	22-360
28th	,,	29-400	29-425	29-330
29th	,,	29-370	29-400	29-325
30th	,,	29-350	29-375	29-280
31st	,,	29-350	29-380	29-300
1st	Sept.	29-375	29-450	29-327
2nd	,,	29-380	29-460	29-330
3rd	,,	29-375	29-445	29-350
4th	,,	29-425	29-500	29-425
5th	,,	29-520	29-550	29-450
6th	,,	29-475	29-530	29-425

The Aneroids on the table on the deck of the Pottinger off Gootala on the 28th June were about 30 feet above the crest of the Annicut.

The Aneroid in Mr. Ranking's House is about 32 feet above the crest of the Annicut.

The Aneroid in the tent at Enchampilly was probably 80 feet above the level of the summer water there.

FRED. C. COTTON, Major,
Civil Engineer G. Dn.

29th December 1853.

C.

Table of the usual rates of the Soyer Duty on Goods at Hasanabad and Shankarageery Parganahs in the Cummummettoo Circar for Fusly 1263 the current year.

No.	Names of Goods.	Per	Duty.			Price at Rajahmundry.		
1	Jaggery	Per naga of 240 lbs.	4	0	0	5	5	4
2	Cocoanut	do do	4	0	0	12	0	0
3	Cummin seed	do do	5	0	0	36	0	0
4	Dill	do do	5	0	0	5	0	0
5	Dry Ginger	do do	5	0	0	20	0	0
6	Long Pepper	do do	5	0	0	56	0	0
7	Pepper	do do	5	0	0	32	0	0
8	Cloves	do do	5	0	0	72	0	0
9	Cardimoms	do do	5	0	0	72	0	0
10	Shauzeera	do do	5	0	0	128	0	0
11	Sandal wood	do do	5	0	0	48	0	0
12	Nuts	do do	5	0	0	24	0	0
13	Maize or Cholum	per cdy. of 8 gunnies	5	0	0	25	0	0
14	Bengal Gram	do do	6	0	0	33	5	4
15	Pesaloo Gram	do do	6	0	0	33	5	4
16	Menoomooloo Gram	do do	6	0	0	25	0	0
17	Horse Gram	do do	6	0	0	14	8	0
18	Lamp Oil Seeds	do do	6	0	0	31	0	0
19	Paddy	per candy	4	0	0	17	0	0
20	Isamaloo	do	4	0	0	12	0	0
21	Sazzaloo	do	4	0	0	16	0	0
22	Korraloo	do	4	0	0	16	0	0
23	Aulloo	do	4	0	0	12	0	0
24	Mauzoom	per naga of 240 lbs.	6	8	0	360	0	0
25	Ghee or clarified Butter	do do	4	0	0	24	0	0
26	Gingeley Oil	do do	3	8	0	18	0	0
27	Gingeley Oil Seeds	per cdy. of 6 gy. bags	6	0	0	44	0	0
28	Tamarind	per gunny	0	8	0	4	8	0
29	Lamp Oil	per naga of 240 lbs.	2	4	0	13	0	0
30	Iron	do do	3	0	0	12	0	0
31	Lac	do do	6	0	0	28	0	0
32	Dammer	do do	2	8	0	8	0	0
33	Honey	do do	3	0	0	12	0	0
34	Stag Horns small and large	per 100	0	14	0	11	0	0
35	Buffaloe Horns small and large	do	0	14	0	11	0	0
36	Chillies	per naga	3	4	0	9	0	0
37	Soap nuts	do	0	6	0	5	0	0
38	Chilla Seeds	do	0	6	0	4	0	0
39	Tauteepauka Cloths in number 8 or a bundle	per naga of 8 bundles	10	0	0	80	0	0
40	Painted Goods in number 8 or a bundle	do do	14	15	9	36	0	0
41	Mangalageery Chintz in number 8 or a bundle	do do	7	11	9	192	0	0

No.	Names of Goods.	Per	Duty.			Price at Rajahmundry.		
42	Man Cloths (country made) in number 8 or a bundle........	per naga of 8 bundles	6	3	0	72	0	0
43	Matheera Thans in number 8 or a bundle........................	do do ...	18	0	0	192	0	0
44	Bombay do do do ...	do do ...	18	0	0	192	0	0
45	Juggunnath do do do ...	do do ...	18	0	0	192	0	0
46	Ralungy, coarse cloths...............	per naga...............	5	0	0	88	0	0
47	He Buffaloes..............................	each	0	14	0	6	0	0
48	She Buffaloes.............................	do	0	14	0	8	0	0
49	Cows	do	0	10	0	6	0	0
50	Bullocks.....................................	do	0	10	0	10	0	0
51	Sheep, small and big..................	per 100.....................	6	4	0	125	0	0
52	Goats, small and big...................	do	6	4	0	62	8	0
53	Dasaly Silk Cloths......................	per bundle..................	1	12	0	18	0	0
54	Opium..	per seer.....................	0	6	0	4	0	0
55	Gunjay..	per maund or 25 lbs	0	8	0	10	0	0
56	Tiger Skins.................................	each..........................	1	4	0	8	0	0
57	Cheata's or Panther's Skins.........	do	0	12	0	4	0	0
58	Carpets	per bundle..................	2	0	0	36	0	0
59	Jumkhannas................................	do	1	4	0	10	0	0
60	Dasaly Silk Thread......................	per maund of 25 lbs	4	0	0	32	0	0
61	Dying Flower, &c. perfumes.........	per naga of 240 lbs	6	0	0	64	0	0
62	Mustard seeds..............................	per gunny..................	1	4	0	6	12	0
63	Salt—From the inhabitants of the Talooks.........................	do	0	7	0	3	2	0
	From the Lambadies who dwelt in the Talooks.....................	per 100 gunnies.....	33	4	0	312	8	0
	From the traders, &c. who usually came from Nagpore, &c. countries, for the purchase of Salt..................	do do	26	4	0	312	8	0
	From the traders, &c. who came from Kummum Circar	do do	21	14	0	312	8	0
64	Square Toondoos.........................	each..........................	1	2	0	6	0	0
65	Kuddies	do	0	10	0	2	0	0
66	Toondoos	do	0	12	0	4	0	0
67	Pieces..	do	0	11	0	2	0	0

(True Translation.)

Camp at Dowlaiswaram: }
22d December, 1853. }

FRED. C. COTTON, Major,

Civil Engineer G. Dn.

Table of the former usual rates of the Soyer duty on Goods at Hasanbad and Shankarageery Parganahs of the Cummummettoo Circar.

No.	Names of Goods.	Per	Duty.			Price at Rajahmundry.		
1	Jaggery	per naga of 240 lbs.	5	8	0	5	5	4
2	Cocoanuts	do do	5	8	0	12	0	0
3	Cummin seed	do do	6	4	0	36	0	0
4	Dill	do do	6	4	0	5	0	0
5	Dry Ginger	do do	6	4	0	20	0	0
6	Long Pepper	do do	6	4	0	56	0	0
7	Pepper	do do	6	4	0	32	0	0
8	Cardimom	do do	6	4	0	72	0	0
9	Shauzeerah	do do	6	4	0	128	0	0
10	Sandal wood	do do	6	4	0	48	0	0
11	Nuts	do do	6	4	0	24	0	0
12	Maize or Cholum	per cdy. of 8 gunnies	6	4	8	25	0	0
13	Bengal Gram	do do	7	2	0	33	5	4
14	Green Gram	do do	7	2	0	33	5	4
15	Black Gram	do do	7	2	0	25	0	0
16	Horse Gram	do do	7	2	0	14	8	0
17	Wax	per naga of 240 lbs.	8	0	0	84	0	0
18	Ghee or clarified Butter	do do	5	0	0	24	0	0
19	Gingley Oil	do do	4	10	0	18	0	0
20	Gingley Oil Seeds	per cdy. of 6 gunnies	8	0	0	44	0	0
21	Tamarind fruit	per gunny	1	0	0	4	8	0
22	Lamp Oil	per naga of 240 lbs.	3	0	0	13	0	0
23	Iron	do do	3	0	0	12	0	0
24	Lac (sealing wax)	do do	6	1	0	28	0	0
25	Dammer	do do	3	8	0	8	0	0
26	Honey	do do	4	10	0	12	0	0
27	Stag horns	per 100	0	14	0	11	0	0
28	Buffaloe horns	do	0	14	0	11	0	0
29	Chillies	per naga of 240 lbs.	4	1	0	9	0	0
30	Soap nuts	do do	0	6	0	5	0	0
31	Chicacole cloths in number 8 or a bundle	per naga of 8 bundles	13	6	6	120	0	0
32	Tauteepauka cloths do do	do do	13	6	6	80	0	0
33	Chintz	do do	16	2	0	36	0	0
34	Mangalageery chintz	do do	9	1	0	192	0	0
35	Man cloths (country made)	do do	7	0	0	72	0	0
36	Matheera Thans	do do	24	4	0	192	0	0
37	Bombay Thans	do do	24	4	0	192	0	0
38	Ralungy, coarse cloths	do do	6	0	0	88	0	0
39	Buffaloes	each	1	4	0	6	0	0
40	Cows	do	0	14	0	6	0	0
41	Bullocks	do	0	14	0	10	0	0
42	Sheep	per 100	10	0	0	125	0	0
43	Goats	per 100	10	0	0	62	8	0
44	Opium	per seer	0	6	0	4	0	0

No.	Names of Goods.	Per.	Duty.			Price at Rajahmundry.		
45	Gunjay...........................	permaund or 25 lbs.	0	8	0	10	0	0
46	Tiger skins..............................	each....................	3	0	0	8	0	0
47	Cheata's or Panther's skins............	do ...	1	8	0	4	0	0
48	Carpets....................................	per bundle............	2	0	0	36	0	0
49	Jumkhannas..............................	do ...	1	4	0	10	0	0
50	Dasaly Silk Thread....................	permaund or 25 lbs.	4	0	0	32	0	0
51	Dying Flower, &c. perfumes........	per naga................	6	0	0	64	0	0
52	Mustard seeds...........................	per gunny............	1	4	0	6	12	0
53	Salt—came on Dhonies	per candy............	8	0	0	25	0	0
	Brought by land..................	per gunny............	0	13	6	3	2	0
54	Square Toondoos........................	each....................	1	12	0	6	0	0
55	Kuddies....................................	do ...	1	0	0	2	0	0
56	Toondoos..................................	do ...	1	4	0	4	0	0
57	Teak timber which was despatched by the land from Toommala Cherroo, Gundeegoodem, &c., Villages..............................	per bandy.........	1	8	0	8	0	0

(True Translation.)

Camp Dowlaiswaram :
22d December 1853.

FRED. C. COTTON, Major,
Civil Engineer G. Dn.

THE
Journal of the Steamer Pottinger
DURING
THE GODAVERY EXPEDITION.

June 27th 3-30 P. M. Left Dowlaiswaram with Major Cotton on board and 2 paddles and jolly boats in tow, and the following crew, artificers, &c. on board, 1 syrang, and 15 lascars, 2 blacksmiths, 1 hammerman; 2 jumpermen, 1 dhobee, 1 naigue and 3 sepoys of sappers, 1 matee, 4 private servants, and 1 brahmin interpreter, and various articles considered necessary for the expedition, consisting of different sized ropes, 4 barrels of gun-powder, axes, sail-cloth, pieces of iron, steel, lead, &c.; got a short squall of wind just as we left, did not make much against it, 5-10 arrived at "Rajahmundry," intimated to interpreter, that he had better land, as he had several times said he was very uncomfortable on board, and he certainly did not appear much otherwise: the fact was all castes were on board, and coming in contact with him. However he very innocently said, "never mind, he could make it out pretty well in the captain's cabin." He was then landed, and Mr. Heise, a German Missionary came on board with servant and things, as interpreter: 5-45 started, 7-45 came to with both anchors in 8 feet water off a lunka, with 3 large trees on it, and from this commonly called "three-tree Lunkah," and is about 2 miles to the N. W. of Rajahmundry: many sand banks exist between these two places. Veered to 33 fathoms, banked the fires up, a strong current running.

28th, 4-25 A. M. Weighed and proceeded up river against a strong current, towards the village of Komadaveram, distant from "Rajahmundry" 7 miles "as the crows flies," but I should say 8 by windings of channel and variations of courses, caused by avoiding the strongest of the currents.—9, passed "Komadaveram," the current moderate till the bottom of the Moolahkah Shoal," when it again got strong, in some places as much as the Steamer could stem—1-55 arrived at "Gootallah," went into bank and took in some firewood—Amildar came on board and paid his respects to Major Cotton, seemed to be a superior gentlemanly kind of man in his way, spoke very good English, and was certainly an improvement on the last Amildar. Took on board a Government peon named Chittiah here, for the purpose of getting us provisions, &c. &c.; saw some of our deep boats here getting firewood. River said to be rising slowly by the natives of "Gootalah," but we saw no drift or foam while under weigh to indicate to us whether it was or not,—3, started,

and instead of going up as usual close to the right-hand bank where a strong current evidently existed, we went over to a Lunkah nearly opposite but a little above "Gootallah" and named by natives "Gootal Lunkah," (our Pilot whom we took on board at "Gootallah" told us this) and went up close to it keeping it on our port hand, with a good depth of water 8 to 12 feet and scarcely any current: however when we arrived at the head of the Lunkah which is opposite a village on left bank called "Ramchendrapooram," we found a strong current and a shoal extending from Lunkah head to the last-named village: the depth of water varied on the shoal from 3 to 6 feet, coarse sandy bottom. This shoal is what turns the river into the very sharp turn below "Polaveram" and over very shoal water in the dry season: got a strong squall here, and steamer could not hold her own against wind and tide; let go small bower, lay at it for ten minutes, then weighed, cast off paddle boats, got over shoal 200 yards in length, found little current, recalled paddle boat, took ditto in tow, and made for another short cut, instead of going round by the great bend of "Godhee," which is the usual channel at this time of the year. This cut is a very valuable one when practicable, as it saves a vessel at least 2½ miles, in which distance there are very strong currents: this cut commences from a large rock with pagoda on it (nearly opposite "Ungaloore" village) and on right bank, and a Lunkah on left side. We went up this, with from 3 to 6 feet and sandy bottom, current moderate till the head of it, or a little above "Pydupaka," when we found it stronger: we kept as close to Lunkah as possible, the current appearing to be running down very strong close to and a little way out from right bank: between the villages of "Pydupaka" and (its neighbour) "Komararam" we observe two or three rocks (black) lying out a little distance from river bank, the highest 4 or 5 feet out of water: on leaving this cut, we went up nearly mid river, until getting close up to the village of "Shinkanapillee," when we went into bank, and at 7-35 made fast to ditto under village; banked the fires up. Took in wood. This day wind strong from N. W. with squalls at intervals, but little rain with them.

29th. 2-30 A. M. Cast off and proceeded up river with a strong current, moon not out sufficiently to look for the slack currents.—5-50 arrived at "Toodagoonta," sent jolly boat for milk and eggs, &c. 6-20 started, observed drift wood coming down the rivers, two dead bodies amongst ditto.—8-45 arrived at "Taykoor," made fast to the bank, men went to breakfast, after which took in some firewood, and at 10 started. The villagers of "Taykoor" told us the water had risen 10 feet during the night: we ran close up to right bank, passing the large rock (situated nearly mid river) opposite "Sheragerry" village; we did not measure it but judged it 7 feet out of water; at a point a little above "Sheragerry," we were obliged to cross over, as round the point many rocks existed; we found the current much more than the "Pottinger" would stem, so rushed her straight across, lost 200 yards in so doing, then sent men on a sand

bank, and gave ropes to them to assist ship—I passed "Koratoor"—1-20 ship touched on a sand bank, but was off again in two minutes. 1-30 got all hands on board again, and ran into gorge, keeping close to left bank till half way through, then struck across them, keeping close into right bank, the water being almost without current, saw plenty of drift wood in gorge, many pieces came against and into our paddle wheels but did no damage, saw no appearance of the far-famed whirlpools of "Koloor," and "Surawaka." 2-30 crossed from a point with much current about a mile below "Peyruntapille," lost very little ground in crossing—3-30 passed "Kundapoody" with nearly slack water close into bank, and continued so till a little above the village of "Poshanun," when we met with a strong current: we still kept close to left bank (rock bound) till opposite "Koyenday," when we found a current: she would not stem; and it now growing late and dark, we crossed over and fetched "Koyenday," made fast to the bank, and put the fires out—firewood finished.

Up to noon this day we had strong N. W. winds without rain; in the afternoon heavy rains accompanying winds.

30th. Daylight, people cutting firewood; our wood having been placed on the bank opposite here, where from current and rocks steamer could not go.

River had risen 10 feet during night.

The large sand bank which existed here in the dry season, was cutting away and disappearing every hour. 1-45 started, a very strong current running, got up to near a point about ¾ of a mile above Koyenday. The point is formed by the 1st hill on this side running down into river, found a very great overfall here, got ropes out, landed 18 men to pull on ditto, tried for sometime to get ship up, at last ropes broke, bore up and went into "Kodengay," made fast to the bank, put the fires out: great quantities of drift came down the river this day.

Up to evening the water had risen from morning 4 feet 11 inches.

We had strong N. W. winds throughout the forenoon of this day with rain at intervals. Wind moderate in afternoon with no rain.

July 1st, 7 A. M. Cast off and steamed up to Koyenday hill, then crossed over to opposite side, reaching a little above the village of Ippoor, found current slack, went up very well to a little past a village called "Malakapillee," a mile above "Ippoor," found a very strong current running off a large patch of rocks which exist here, crossed over, fetched a little below a village called "Takoor" not down in district map, (it is situated about half way between "Koyenday" and "Chegoormamoody,") went up, with quite slack water, to the rocks in the bend of the river at the latter-named village, when we waited about an hour for the paddle boats, they having been cast off; when we crossed, paddle-boats came up, did not take them in tow, gave them directions to cross again as we were obliged to do, on account of the rocks just mentioned: we crossed, losing about 100 yards, found

slack current, and ran up to within half a mile of the village of "Sokumpully," made fast to the bank, and men breakfasted at 12-30 P. M. The river appeared to have fallen 2 or 3 inches during last night, and was falling very slowly, apparently, during this day up to noon; 2-30, proceeded, went up a hundred yards past "Sokumpully," the current increasing, crossed over, losing very little ground, got into slack water, and ran up close to bank with from 7 to 10 feet water, sandy bottom, till we came to a large sand bank 3 feet out of water, attached to bank, and extending out 300 yards; went out round ditto, keeping close to it in 3 or 4 feet water, came to a place with a great overfall, got ropes and men on sand bank, got ship over it. The sand bank just alluded to is a little below a river laid down in district map, near but below "Roodrumkota:" we ran close into the river's mouth, and took on board Major Cotton who had been landed a little way down, went up close to bank 200 or 300 yards in hopes of making a short cut inside another sand bank; but we found the water shallowing so fast from 8 to 2 feet 10 inches, and fancying the river to be falling, we went back and cut round sand bank; found current strong in places. Just before dusk we observed our iron boat, (a circar cargo boat) which left 6 days before we did, a little above "Kounaram." 7-45 arrived at "Roodrumkota," made fast to the bank, put the fires out, observed very little drift this day, current evidently taking off a little; firewood out. The number of crew, and description of the red or iron boat, may be worth relating; she is 60 feet in length, and broad and 5 deep, with one mast and sail; she had a crew of 10 men on pay of 4 Rupees each per month; she is entirely built of iron; and is painted a bright red colour, which gives her the name of "red boat," as she is usually called. She is on her road up for cargo from "Mahaideopoor" or "Chinnoor;" they started in a hurry without any preparations or notice sufficient to make her as efficient as possible for such a trip; for her whole equipment consisted of her bamboos, her sail, and rope of 3 inch, much too large; her sail is very small for her; she ought to have had another mast and sail, her present sail to have been much larger; a good set of oars to enable her to cross the river with, to evade the strongest currents, with axes to cut away overhanging bushes which might obstruct their tracking: a small sungedy is a very essential thing for a boat going up this river, as a tender, to lay out a rope across a nullah, instead of the men swimming it, at the great risk of being taken by alligators which abound in these nullahs and creeks, having got in there out of the strong current. This day was attended with light N. W. winds with a few passing showers.

River certainly falling slowly since noon.

2nd. Daylight, people cutting firewood—river had fallen a few inches during night; and we now made out that up to this time the river had risen 26 feet: this was pretty clearly proved by a rock lying under the village of "Konnanum," which was measured by Mr. Tuke during the dry season (about

12th June last) and was found to be 21 feet 6 inches, being now 4 or 5 feet under water. This is the best calculation we could depend on, as our observations taken from the steamer cannot inform us rightly, for whilst under steam we could not possibly tell.

8-20. We crossed over to " Konnanum" a village close to the upper bank of " Sepry" river, with a Pagoda a little in rear of village : our object in crossing to this village was to take in firewood, which had been placed here by the Zemindar of Rakapilly ; 12-10 started, went up nearly mid river in a line of rather slack current, strong currents prevailing on either side at bank, came to a sand bank which ran out from a village called "Goomoodoodium," (a Pagoda at it) parts of it a foot or so above water, tried an apparent passage through two pieces of it above water—water too little, went back and outside it, came to an overfall, tried all dodges to persuade her to go up it : we bottled our steam, pushed her with bamboos, but all of no avail : nothing but a knot more speed was wanted, and she would have gone up it easily, instead of after wasting fuel, time, patience, and every thing else, going back defeated by a trifle to any decent steamer ; 6-30 returned and ran into Sepry river, let go S. B. veered away, and hauled ship into bank, put the fires out ; no current in "Sepry ;" river had been falling during the day, but very slowly.

The morning was attended with heavy wind from N. W. and very heavy rain ; afternoon moderate wind with light passing showers. At this time the river " Sepry" was said by the Natives to be navigable 8 miles or so for the Pottinger, not farther on account of rocks. Teak could be now floated down 16 miles, large wood.

3d. No rise or fall in river during night ; at daylight we landed with the intention of walking over to see " Rakapilly ;" just as we landed, the old Zemindar (Sooreereddy Enkiah by name) of Rakapilly, with his retinue of relations, peons, one palanquin and a pony, arrived and received us on top of bank : he is a very fine looking old man with a fine long white beard, part of which by the bye, he tucks up behind his ear, covering the parts of his face where whiskers ought to have been, and making you think he had a fine pair of the latter. Major Cotton told him we were going over to see his places, at which he seemed very delighted, and offered the palanquin and pony, but we all walked, which was a thing he evidently did not do every day, for he seemed to be dreadfully done up, but still could not be prevailed on to ride, but said he was delighted. After a walk of 2 miles over a fine rich piece of ground nearly all uncultivated, we reached his village, " Rakapilly :" we then went to his house, which was surrounded by a strong bamboo fence, with a watch tower at each corner, made of strong logs of wood, with holes for firing through in case of being attacked. He certainly could not have expected such a thing to happen, as

his fortifications were in a most dilapidated state, many parts of the bamboo fence being broken down, and one of the watch towers down altogether: we entered his castle through a large thick iron-bound door, and were shown into a shed, with chairs and carpets placed on it; we remained there about an hour talking with him, then returned to the steamer in the afternoon; the Zemindar came on board with suite and saw the steamer. River fell 13 or 14 inches during day; a fine day with light N. W. winds; one squall of wind during day about noon.

4th. Daylight started, no paddle boats in tow, crossed over to "Roodrumkota," went up 100 yards above it, found current strong, went out mid river, and went up so. 8-30 Passed "Ramchendrapoorum," went in close to bank by "Goomoodoodium;" current being less in there, continued this course till near Goomooodoodium Pagoda Hill (¼ of a mile above village) which runs down in a point to the water, found a strong set off this point, went out mid river, and went up till a little above "Poatla," then struck across and fetched ditto, made fast to bank, people breakfasted at 11-40 A. M. Took party and ropes down to Pagoda point, and got red boat round, gave her some small rope, ½ inch, for tracking: this rope was made in Rajahmundry of cotton, and was very strong, and the best for these purposes that can be obtained. 1-15 started, passed Kasarum at half past 4 P. M., having come up mid river from "Poatla" over a shoal, water from 3 to 7 feet, current moderate with the exception of about 200 yards nearly opposite "Kasarum," ran up to a village called "Vengerum" about a mile above "Koondapully," we having been told that firewood was there ready for us; found none, then went back to Koondapully, and made fast to the bank, put the fires out. This day fine, with strong N. W. puffs at times. The river neither rose nor fell during last night, fell 4 inches during day.

5th. River had risen 3 inches during night—daylight employed cutting firewood. 10-30 started, went up close to sand bank attached to right bank, until near Madarum Pagoda Hill, (one mile below village) found current strong at point of hill, crossed over to a Lunkah existing here mid river, got ropes and men out on ditto, pulled ship up 100 yards, got into a very moderate current, in 4 feet of water, sandy bottom, got ropes on board. 1-30 passed "Madarum:" after passing Lunkah (opposite "Dumucherla") we went into near left bank, and ran up close to ditto with a moderate current to a village called "Gojoobakah," a village on left bank a mile and a half above "Polalum;" half a mile above "Gogoobakah," came to a strong current caused by the "Duavarapillee" hill running in a point into river: this is the point where a bad whirlpool is said to exist; we overtook the red boat here, we crossed the river, here, and ran up with slack current keeping close to a sand-bank with from 4 to 6 feet water. 5, a fine fresh breeze on port beam sprung up, set our 2 sails, 7-30 dark, arrived at "Goompanapillee" hill point, tried for an hour to get round ditto, could not

stem the current, went back to "Goompanapillee" village, made fast to the bank, put the fires out. This day fine with few showers in morning, fresh breeze in evening from Southward.

6th. Water rose 2 feet during night; daylight sent paddle boats up to Ryagoodem for firewood, we cutting also here. 10-30, started, went up to Goompanapillee point, then crossed to left bank, went up close to ditto, passed some rocks attached and running out from bank, nearly opposite "Ryagoodem" current moderate; 3, wind from Southward, made sail, 3-30, arrived at "Bhadrachellum," made fast to the bank, put the fires out. The Zemindar came on board soon after we arrived, he is very young, he had just returned from "Hyderabad" where he had been summoned by the Nizam on account of fighting with another Zemindar, who disputed the right of the "Ashrowpetta Talook" with this man; and his story was, he had been placed in charge and the other man detained in "Hyderabad;" he seemed very obliging, and inclined to do all he could to assist us: of course he as well as all other natives were much astonished at the "smoke ship." His muntree, or apparently his adviser, seemed a sharp business-like man: the young Zemindar seemed more full of fun and not a man of business. Had several squalls of rain and wind during day from different points of compass. Tents on opposite side of river.

7th. Water rose 2 feet during night; daylight, opened man holes of boilers, employed cleaning ditto inside; 7, Zemindar came on board, 2-30 P. M. red boat arrived. This day was attended with constant showers of rain, and variable strong winds. Observed that all rocks were covered excepting the large patch a little above Pagoda hill.

8th. Water fell 1-11 inches during night, 7, measured with level the bank and the highest rise ever known, the actual bank measured 30 feet 11½ inches, and the highest rise pointed out was up to the window sill of an old temple close to edge of bank, this measured 34 feet 1½ inches. Noon packed man holes of boilers, commenced filling boilers, water fell 2 feet up to 3 o'clock this afternoon, then began to rise: got a little firewood on board. Major Cotton and Mr. Tuke crossed and saw elephants, &c. Had two or three squalls of wind and rain from S. W. during day.

9th. River rose 1 foot 10 inches during night, gave red boat 2 pilots and started her at daylight; she crossed to opposite side and went up with a nice breeze. Sent people to village to get more firewood, brought it down and cut it ourselves; 10, lighted the fires, 11-40, Zemindars and suite came on board, started with him on board, ran up a little along the bank to enable him to see her working, landed him, made sail and crossed the river, went up near bank till opposite the island of "Moothair" with a moderate current, crossed here, kept close under the island, then went up half way between it and the left

river bank, with a strong current against us for a mile above "Moothair" island, then current slacked, we passed "Moothair" island at 2 P. M., observed that all rocks were covered about here but many just a wash ; 6, arrived at "Duntanum," made fast to the bank, put the fires out and wooded ship. This day was fine with a few light showers of rain, during afternoon winds strong from westward up to 3 P. M. then fell light.

10th. Daylight river falling slowly, 6, started, went up close to reef running out from hill a little above "Duntanum," then crossed over, a very strong current running down, fetched a little above "Gollagoodem," (one mile above "Nelepack") found slack water close under bank, 10, passed "Chintaroala" village, went up close to the barrier, then crossed over to "Rakapilly" (a village opposite "Chintarala") ford, the highest rocks of the barrier, that is, the one close into right bank, were covered, but broken water over them ; the whole line of barrier was faintly marked by broken water ; on arriving at the ford, we went up near the left bank over the pebble bed existing there, by the sounding men's account the pebbles still there ; Mr. Tuke felt them also ; all up this pebble bed we experienced strong current ; we had ropes out part of the distance, but not the worst ; thick bushes and trees preventing tracking being easily effected ; nearly the whole distance is good for tracking, but at the very head of the bed the bushes exist : it was for some time doubtful to all whether she would go up or not, but after trying her a little way from shore and different other lines, we pushed her close into bushes, one wheel in them, and very slowly got up ; but from this to "Doomagoodem" we had a very strong current, one jolly boat tackle-fall broke and she swamped, cut her adrift, with a man in her, who got hold of a bush and hauled her into shore, took her again in tow, having lost 2 of her oars, and reached "Doomagoodem" at noon. Made fast to the bank, put the fires out, our great object having been accomplished, namely, getting over the barrier : this is what made us work on Sunday, for a change in the river might have prevented us so doing : the river apparently falling ; wooded ship by coolies. This day fine with very light N. W. winds.

11th. Water fell 4 inches during night ; 5-30 A. M., started, went outside a lunkah which runs up close to left bank, from "Doomagoodem" village to one named "Cothagoorem ;" the lunkah is close to main land, a small channel only existing between the two ; we went up with a moderate current to rocks (opposite a village on Lunkah) there were many above water, and strong currents, and cross currents running through them, which made it intricate and dangerous to such a steamer as the Pottinger ; however we passed some rocks, and eventually touched one ; we hung on it (amidships) for about a minute, when she quickly droped astern of it, and we now determined to try the channel inside Lunkah ; backed her out of rocks, turned and run back

into "Doomagoorem Lunkah channel;" found a very strong current running down it, red boat puzzled by it, for we found her in here trying to get up by ropes &c.; the entrance to the channel was rocky almost all across, with the exception of one small channel close into left bank inside some large trees; we first tried the rocky part, but having sounded on one 3 feet, we thought it best to abandon that part, and try close to left bank; after trying for some time, we found that the bushes were such obstacles to our laying ropes out, and so much time and firewood wasted, that we gave some coolies to red boat, and we went over at 10 o'clock to "Ameyerrupillee" where the elephants were encamped; our intention being to see if we could get up that side: we arrived there, and Major Cotton and Mr. Tuke, walked up to reconnoitre, but found from the rocks, currents, &c., it was ridiculous to try the Pottinger at it: we returned to "Doomagoorem," having filled up with firewood at "Amenpillee;" red boat gone; 4-40, made fast to the bank at "Doomagoorem," put the fires out. It was this day that we first heard of the sickness of the poor old elephant, and he died 2 or 3 days after; he was a fine male, and the best one we had; cause of his sickness not known; at noon this day heavy rain, but fine in the morning and afternoon, wind N. W.

12th. Water rose 2 feet during night. Daylight laid warps out along left bank of "Doomagoorem Lunkah channel" for hauling ship up; 7, started, hauled her through the first piece of bad current, got ropes on board steamer, stemmed it till abreast of village, came to a very bad place, got small ropes out, ditto broke, bottled steam and tried her again; she made a business of it, and slowly crawled up; we passed over a rock, one point of which had only 4 feet water over it; the situation of this rock is mid channel, and 80 or 90 yards above the village on Lunkah; we passed the rock but remained stationary for a good half hour; 20 yards above here got a rope out, and got into right bank; men breakfasted, after which at 10 o'clock, we laid warps out to get her over a very bad piece of very strong currents; 12-30 P. M. we again started, and with very great difficulty got her up to where the warps were made fast, laid them out again and again, till we arrived, at 6 P. M., at a small village named "Kasaverputnum," half way between "Doomagoorem" and "Cothagoorem," when we made fast to the bank for the night, put the fires out.

We had a very fine day with light puffs in morning.

I forgot to mention that we overtook the red boat this day close to a patch of rocks with apparently about 2 feet of water over them: they are situated mid channel, and 400 to 500 yards below the village of "Kasaverputtam." The red boat came up and lay astern of us during night.

13th. Water fell 9 inches during night; daylight, employed wooding ship. Red boat started. 10-20 started, observed a rock opposite here nearly mid river, but nearer to right hand river bank about 2 feet above water, went up with

a moderate current, but apparently a very strong one, so much so that we did not take the boats in tow; passed the river at Purnesala, and arrived at the village at noon, took in a little firewood, waited for boats not up yet, shoved off and ran back for them, observed patches of broken water from rocks near the surface off the "Pamuchalu" river; caught the peon sent by Zemindar of "Badrachellum" to collect our wood, in robbery, he having taken all the money we paid the people at "Doomagoorem" for our wood and their coolies, from them, never giving them one pice of it. 2-20, took boats in tow, and proceeded, keeping close to left bank, there being scarcely any current in this part; observed a very large alligator lying on bank; we ran up to a village called "Gagbaku," or rather to a point with rocks at it and running out a little way from point, then went out, skirting a sand bank which runs out from village; we had 3 to 5 feet water over this bank which runs out to mid river; after running up over this sand bank 4 or 500 yards, it shoaled so much that it drove us into the strong current, which we could not stem; then crossed and got close into right bank, a little above "Mungoor," where we found the current weaker but still nearly enough for us; at 6-45, we reached a village called "Uchunagoora," or in other maps, "Unarum," where we made fast to the bank for the night, put the fires out.

Had a fine day with very light N. W. airs, and observed a small water fall on hill at "Rowagoorem."

14th. Water rose 2 inches during night.

Daylight, tried to get firewood here but could not; 6-10, started, went up close to right bank to a village called "Singarum" opposite "Lingalah;" then went out round a sand bank, past which a very strong current was running; tried to get up 200 or 300 yards out from ditto; water shoal; made in for sand bank again, got ropes and people out on shore, got ship on very slowly till a point at Ramanjeeveram; river bank falling in large pieces, so much so, we deemed it necessary for the safety of the people tracking, and the steamer herself, to abandon tracking, and get out mid river and try for a more favorable current; took ropes on board, cast paddle boats off directing them to follow us, and struck out mid river, found a more moderate current, until 100 yards below a lunkah lying opposite a village called "Palebempully" on left bank, where the current was very strong, too much for steamer; drifted on a sand bank, got ship of ditto with a little difficulty; firewood nearly all out; lay an anchor out while we got steam well up, weighed, and made into "Lunkah," made fast to ditto, sent all hands to collect firewood, collected a little, then shoved off, tried to get up so as to reach "Byarum," when we had firewood ready; steamer going astern went round bottom of the lunkah, and ran to another a little further in; made fast to it, put fires out. At noon we saw much drift and foam coming down river, the river rapidly rising. Water rose from noon to evening 1 foot 2 inches.

It was five o'clock when we put the fires out; we then hauled small paddle boat over lunkah, and sent to village to get firewood ready by morning. This day fine with a shower at noon and strong N. W. puffs in afternoon.

15th. Water rose 3 feet 4 inches during night.

Daylight, started, ran up round lunkah and into village of "Palebompilly," sent people on shore to cut firewood; water rising fast from morning up to 1-45, rose nine inches. 1-45, started, went up left bank close to bushes; current moderate except in places here and there; at 2 of the latter we had to lay ropes out and haul ship up; one place was at a point where one pilot said rocks existed; sounded for ditto, found 5 feet over them; these rocks are attached to bank and are near "Bundagorem," between this village and "Beenapooram;" cast paddle boats off at this point, arrived at Idrain village at 8-20 P. M. put fires out; we saw nothing of the rocks said to lay off this village. This day fine with strong N. W. winds.

16th. Water fell 16 inches during night. Daylight, people wooding ship; 10, started, went up close to left bank, with a moderate current to a village, name unknown, where we had difficulty in passing a point, cast boat off, got round, went inside an island, meeting with strong sets off bushy points, after leaving island, till we arrived at "Sooroor" point; at 4 P. M. tried steamer at the current round this point, she could not look at it, did not try ropes as it was too late; the banks being so thickly wooded, it could have taken some time to have laid warps out, and firewood getting short, we made fast to the bank, put the fires out. Had rain frequently during day with strong N. W. winds.

17th. River fell six inches during night. During day fell half an inch.

4 P. M., began to rise.

Villagers brought wood during day for ship; sunset, had completed wood; much rain and strong winds from W. W., much drift coming down in afternoon.

18th. Daylight, laid warps out, 7, lighted the fires, got steam up, 9-30 started, got 80 or 90 yards round point with great difficulty; rope, new 5½ inch coir from Gahan and Eaton of Madras, broke; went on again, 11 started; ropes broke again; employed bending and repairing and laying ropes out again till 2-45, started; ropes entangled with bushes, broke again; went back and made fast to bank, put the fires out. People employed getting warps up from bottom, got a little up, but lost 3 coils of new rope. River rising, rose from morning to evening 2 feet 11 inches.

N. W. winds with passing showers during day.

19th. River rose 4 feet 6 inches during night.

Daylight, laid warps out again to take a final trial; it was a long time before we could get any of the ropes (broken yesterday) up from the bottom, but we

eventually did, having lost a fine coil of English $3\frac{1}{2}$ inch; got some firewood on board, and at noon tried her at the point; got up 100 yards and with all we could do, could get her no further; we had a large tree close to our rudder, and seeing that if the rope broke she would certainly have lost it, besides the chances of losing our funnels by a large bough of the tree hanging over river, we abandoned the idea of getting up here, and struck across the river; could not head a lunkah opposite here, went below it, and went in close to bank, fetching Chugulpullee, a small village, waited here a few minutes and took tappal on board; 4-10, started, went up close to right bank, and in and through jungle with nearly still water; we were obliged to keep in through this jungle, the current being apparently too strong outside it; we continued in this way up to near a village called "Baistagoodem," nearly opposite "Albaka," where we again came into the open river, went into "Baistagoodem" at 5-30, stopt there 10 minutes, went outside a piece of lunkah lying off village, kept close into it in 3 to 4 feet water, to avoid a very strong current; a little outside, steamer grounded; at 6-7 got her off, went back and lay off the village of "Baistagoodem" at B. B. in 7 feet water; put the fires out.

From daylight this morning up to noon on the time we left "Soroor" 9 inches; passing showers with moderate N. W. winds during day.

20th. Water rose during night one foot. Daylight, started, tried a passage inside the piece of lunkah, but found water 2 or 3 inches too little, went back and tried outside; got ropes out and tried to haul ship up, could not; before we laid ropes out, the ship was drifted on bank, and grounded; laid S. B. out, got ship off, obliged to slip the anchor, when we found we could not get her up with the ropes; the river having been rising, we again tried the inside passage, and with great difficulties from shallow water and bushes succeeded in reaching "Wuddagoora," at 9-30, where we made fast to bank to take in firewood; sent a party to get anchor; however they could not find it; it must therefore have been carried by the current from off the bank; it was let go on into deep water, where the men did not dare venture.

People breakfasted; afterwards took in wood; 4, started.

River had risen from 10 this morning till 4 in afternoon, $2\frac{1}{2}$ inches.

We kept close into right bank, meeting with many strong currents from off little points and bushes, 5, passed the village of "Chinsopullee," 6, passed a deserted village, and a quarter mile above this got ropes on shore with men, and pulled her up 200 yards, when we came to a very strong current, tried to get her round but did not succeed; 9-30 went back to deserted village, made fast to the bank, put the fires out: the reason of our going back this piece was on account of the bank, which we could not get round, being high and steep and falling away, which made it dangerous for steamer to lie under: the bank at deserted village was very low.

During daylight N. W. winds and heavy rain and wind during night.

21st. Water rose one inch during night. Daylight, people cutting firewood from deserted village, 2 started, got ropes out at the point which we could not get round last night and hauled away, the rope was made fast to foremast to take it clear of bushes, foremast went off short at deck, made rope fast to betty, got her up, laid ropes out 2 or 3 times again, and went up to a point 2 miles above "Chinsopullee" at 6-30, when a very strong current with overfall presented itself: although we had little hopes of succeeding we tried to get round, but the Steamer was perfectly overpowered; we had again to run back and look for a part of the bank which was safe to lie under for the night, found one half a mile back, made fast, put the fires out.

While we were wooding at deserted village, river fell three inches.

Much rain and strong N. W. winds during forenoon. Fine in afternoon.

22d. Water fell two feet during night. Daylight started with little firewood, none procurable here, went up to the point, put her at it, having cast the paddle boats off and told them to try to get up through the bushes; she went astern, so we made for the other side, and found a moderate current near a lunkah a little above a village called "Aukarugoodem" 2 miles above "Albuka," going up it fast, firewood nearly out, and saw no village ahead which we could reach with present wood, cut up old foremast and ran back to "Aukaragoodem;" 8-40 arrived there, sent people for wood, observed many beautiful water falls here at the back of this village, now known as the "Cotton falls." 3-10 started, went up outside lunkah with moderate current, till at a shoal opposite "Nullagontapilly," at a corner of which we joined a great current, we put an anchor down and bottled our steam, and over it she went; we afterwards had rather strong current, till we brought up at a bank for the night at 7 P. M., put the fires out. We soon knew we were opposite "Mungapett," but did not like to cross, as we saw no lights there to direct us, and we had seen in daylight the steepness of the banks about there, and knew a very strong current must exist, so that had we tried to have crossed in the dark, we might have missed the river, and then have been obliged to return to this side, as it was impossible to have laid under such steep banks; during forenoon this day much rain, and N.W. winds. Fine in afternoon, rain had fallen while we were at "Aukuragoodem" one foot 4 inches.

23. River fell one foot three inches during night. Daylight started, crossed over to "Mungapett," kept her head nearly straight up river but a little inclined to right bank, strong current running till we got close to a small lunkah lying mid river and a little above "Mungapett," passed close under foot of lunkah in 2½ feet water, then made straight into bank, ran down it into river at "Mungapett," steamed up it finding deep water close to right bank for about

100 yards, it then shoaled to 6 and 7 feet, ran up to near village of "Mangapett," found then only 3 and 4 four feet water; and as the Godavery was falling, we went back to near river mouth and made her fast to the bank, called tents from village and pitched them here, took every thing out of ship to clean her, and clear her of any rubbish. Received tappal when we arrived here, news of the New India Bill at the centre of the town of "Mungapett;" the "Mungapett" river was very shoal, 4 or 5 inches water only. Authorities visited us. This day fine with straight N. Wn. winds in afternoon, squally from N. W. with rain, water falling all day, fell 1-9 up to evening.

24th. River fell during night 2 feet six inches, but a little after daylight rose, from which time up to 2 P. M. rose 4 inches, then began to fall again.

Coolies calling firewood for ship: a great sporting Rajah from a village near "Mungapett," (I have forgotten the name,) visited us. A fine day with a few passing showers in the afternoon, a squall of wind and rain, wind N. W.

25th. River fell 2 feet 2 inches during night. Daylight employed wooding, and getting all things on board preparatory to starting, 1 started.

Water had been falling from morning to this time, had fallen 10 inches, went three quarters of a mile up close to right bank, when, finding the current strong, we struck out to mid river, keeping over pretty close to a lunkah opposite Oopairoo and running up to "Venkatapooram," found the current very moderate, ran up on the course to opposite "Marcul," when we closed upon a lunkah off the village (not down in our map,) it lies about 400 yards off the village; on leaving the head of this lunkah we shaped our course for the foot of "Nuggarrum" lunkah, and a channel between it and main land, reached channel with moderate currents, kept mid channel, and ran up and off the village of "Nuggarrum," at 6 P. M. went into bank and tried to get ship wooded at once, no wood coming after waiting a little, went off and let go B. B. in 9 feet of water.

We plainly saw that the river had been rapidly falling during the day, but how much could not say.

Day fine with straight N. Wn. airs.

26th. Water had fallen during night 1 foot 10 inches.

Daylight commenced wooding ship. The Naib of Nuggarrum came on board, 8-30 started, with a shoe-maker for a pilot, 8-40 grounded on a spot of muddy sand running off a lunkah, 10 got her off, and proceeded down "Nuggarrum lunkah inside channel," the same we came up yesterday, then went out round foot of lunkah, and up along and close to it for a short distance; but water got very shoal and drove us out nearly mid river, when we found current very strong, ship going fast astern, went a little over towards lunkah, and succeeded in getting in close to it above the shoal water spoken of just now, went

up close to lunkah for 300 yards, came to a strong set, made out for mid river where many shoals existed, in hopes of getting over them with shallow water and little current, but on reaching them, found that they were so uneven in their bottom, one cast 7 feet another $2\frac{1}{2}$, that we kept a little nearer lunkah, however we moved slowly up till we got a little past the head of "Nuggarrum:" lunkah, (half a mile) when we could not move an inch a head, there being a tremendous set down the channel to "Nuggarrum:" (or read down the Nuggarrum lunkah inside channel) this set is much strengthened by the position of a small island (not down in maps) which lies off the right bank at a distance of 200 yards and about a mile above village of "Lunkatumpully;" the water has a great set off the inner point of this, which just shoots it into "Nuggarrum lunkah inside channel." Our shoemaker friend the pilot told us some rocks lay at and off "Bomumpullee," but could give no great account of them, we did not see them.

We now made a shoot into right bank, found water with an eddy close (scraping paddle box) to bank but 15 yards out a great current, we had landed the men with ropes expecting currents, but had no use for them, went up to opposite the little island just alluded to, and cut a little firewood from some old places erected by Natives for watching their crops, from 1, got the sticks on board and cut them up as we went, still keeping slack water up to the village of "Rampooram" when we made fast to the bank for the night, put the fires out. This village ("Rampooram") is not down in map, but is directly opposite to "Kongulgunpooram," near "Poosoor;" it is a very small Gond village.

Fine with N. Wn. winds, strong at times.

27. Water fell 2 feet during last night. Daylight wooding ship, 8 started, went up close to right bank to nearly opposite "Chintoor," then went out nearly mid river, but rather nearer left bank found, currents vary very much here: 20 or 30 yards took you from a moderate current into one you could not stem (that is from right to left), at last we hit the right line and went up fast, being about 200 yards from left bank, saw an immense alligator (white) basking on a sand bank; 9-30 passed "Chintoor," having got close under bank here, went up so as far as "Atlagoorem," off which a large sand bank lies, and which our friend the shoemaker told us we could get over, but he was mistaken, and we had to run back round and under the shoal and up outside it with from 4 to 7 feet water. There is a village in a bend of the river on right bank opposite "Chintoor" called Kusteelpully, but which appears to be placed rather too low down, off which, lying well out in the river is a large high patch of rocks, in fact a small island, (it is surprising that such danger as this is not down in the map) we still continued skirting the shoal keeping in 4 to 5 feet of water up to "Koorkulloo," at which village the sand bank commences, we now kept close into left bank, and ran up with moderate current to "Worragoora," where we arrived at 1-30; took in a little wood here, which was ready cut for us, and waited for

tappal, which we saw on other side. 2-15 tappal came, started, crossed over to island opposite this village, ran up with slack water close to it, keeping it on our port side; it should be remarked that from "Worragoora" upwards the current was very strong close to left bank, and several patches of broken water, as though rocks existed under them; at the head of the island a large sand bank lies, which runs out to right and left from head of island and some distance above it, water varying from 2 to 7 feet over it; skirted this in 4 feet water, bed very uneven, could not get up, made a shoot across, found current immense, got back to shoal, tried and tried, at last, at 5 P. M., got her up high enough to weather head of shoal, and then crossed over with shallow water to a village called "Goodecola," went in close to ditto intending to lie there for the night and get firewood, but found only 4 to 5 water alongside bank, and the river then falling, we might not have got out next morning; determined to go on to next village, found a current here, out ropes and hauled her up, and at 6-30 made fast to the bank at the village of "Suchenapooram," 1½ miles above "Goodecola;" put the fires out.

This day fine with light N. W. airs.

28th. Water fell 1 foot 3 inches during last night. Daylight employed wooding, 8-15 started, ran up to a village a quarter of a mile above this, named "Davadoolah," took in a little wood here, found rocks 2 feet above water lying under and out from village 20 or 30 yards and more, said to have been 2 or 3 feet under water for half a mile up, and lying 15 or 20 yards out from this (right) bank, also observed that there were rocks off a village opposite these 2 villages, named "Sandaputta:" there seemed to be a good sized patch of them, and they were 1½ feet above water. 9, Proceeded, kept as close to banks as the rocks allowed, and ran up with moderate current to a point which lies a quarter of a mile below the great whirlpool point, when we observed a large patch of rocks of 100 yards in length and attached to, and running out from bank 100 yards, varying in height from 12 to 2 feet, found rather a strong set round these rocks, but we got up and now sighted the lions of the place, the whirlpool point, and the narrow river of "Mooknoor" *as it is commonly* called, for where "Mooknoor" is written in the map Tharlagoodem ought to be; "Mooknoor" is a very small village inland, on the opposite side, we were at it, and found it 1½ mile inland from "Enchumpully" and there is no other "Mooknoor," but in the map we had, we found many little mistakes of this kind, positions of lunkahs, villages, rocks, &c., very many.

After passing the patch of rocks just described we went close into and past a high sand bank evidently thrown up from the first whirlpool; on it we saw some loose rocks, which had without doubt just been thrown up by some strong power which must, we considered, have been the whirlpool; these rocks, some weighing a ton, were deposited 100 yards below whirlpool; we passed the sand bank, and came to *the* point; the hill here runs down with a sloping foot into river, but

is curiously formed, running down into water in 5 or 6 ridges with deep chasms between the bottom ridge or end of the whole point or ridges combined, is very perpendicular, at the bottom of which is a large whole cut in, with soundings from 15 to 40 feet: the hole is perhaps 20 yards across and running in from river 30 or 40: in this hole, the bad whirlpool is said to exist (it is necessary to say the bad or worst whirl as several are said to exist, and which the small accompanying sketch attempts to explain); we ran up and tried to get round this point, but could not stem the current, and then appeared broken water as though rocks not many feet under water ran almost right across from here to the rocks under the village of Tarlagooden, but by subsequent observations it could not have been rocks, at all events near the surface, as since that when the water had fallen 11 or 12 feet, the troubled water alluded to was as smooth as a mill pond and no appearance of a single rock: therefore the cause of the broken water is mysterious: on finding we could not get round the point we dropt a little to keep clear of the broken water, and struck across to opposite side, reached ditto just below the village of "Tailagoodem," just below a single rock 3 feet out of water, and lying off the bank (rocky) 20 yards, sent jolly boat and sounded inside ditto, found there was water, went through, keeping outside "Tailagoodem" rocks, but close to them: these rocks are worthy of a slight description as they are said to affect the whirlpools; they are in two patches, not connected with the shore, but having a channel 40 yards broad, which is very shallow, and a few small rocks in it between: the upper patch lies in a direction across stream, and shows a straight wall front to it, its length is 70 or 80 yards, breadth 40, and its height 21 feet: below this is another patch of nearly same position and size, but neither so high or so walled in its formation: they are of a slaty nature but hard. The current is said to be set off wall C, forms the whirl 1, and goes on to whirl 2, and the passage recommended by the Natives, during the time of the whirls' existence, is close outside patch C, it is said to last sometimes for 4 to 6 days: about 200 yards above "Tarlagoodem" we observed a small single black rock 4 feet out of water, and lying off shore 30 to 40 yards, with broken water lying some distance out into river, went inside this rock, close into bank (rock bound) and continued on this shore, passing a very high sand bank; this sand bank is evidently thrown up "slate reef point" by a reef which runs out at a good angle from the foot of a hill, it can well be known as it is opposite a large nullah close below "Tremet" village, the reef ran out where we were more than 90 yards and 40 yards in breadth and 21 feet high, mostly of slate, it has a large whole at bottom of it, at which they say at times a small whirlpool exists, 200 yards below here, but on opposite side we saw a very large patch of rocks nearly attached to bank, and lying off it 200 yards, highest of them 8 feet above water, these are directly off the 2d

nullah from and below "Tremet" village; between this point and "Tremet" we observed two or three patches of troubled water apparently over rocks; remained under the reef for an hour or so, the wind being very strong against us, cut a spar here for foremast called "Nallu muddee;" 2, crossed, ran up 150 yards from right bank till a little past "Tremet," then went in close, ran up a short distance further, stopt for wood; 4-45, started and went up close to bank inside a large reef, which lies out from bank 120 yards, it commenced at the 1st "Nullah above Tremet" and ended at a corner with a large Nullah the 2d from and above "Tremet," found a strong current at the head of the reef and the passage rather narrow, a large patch of sand is thrown up the bank at this corner where the reef ended, saw a large alligator on it, fired at him, went up close to bank up to "Enchumpully," then went out mid river, and tried to get through a reef of rocks we saw a mile a head of us, but the current being strong and getting dark, we went into bank and lay in 6 feet water rocky bottom; put the fires out.

Fine day with strong N. W. winds.

29th. Water had fallen 1-10 during night; daylight started, steamer grounded on a rock, 40 yards from shore; this is where our pilots had told us there was 14 or 15 feet of water: saw no ripple on water to indicate rocks, got her off in about half an hour, went into bank; Mr. Tuke went in jolly boat to try and find a passage, found a very narrow one, tried it, ship struck heavy on a rock on starboard beam, a baft paddle wheel, recovered her, but shortly struck again, ship grounded, threw firewood overboard, and sent other things on shore to lighten ship and after some trouble got her off, saw it was no use risking the ship any more, found out the best place we could for ship to ground on, as we saw we had no hopes of getting out, being perfectly surrounded with rocks of a slaty nature, secured ship, put the fires out, landed everything, and sent all hands on shore to keep her as light as possible; rocks now soon began to appear all round us, water falling very fast during day, 10 inches afternoon. Major Cotton and Mr. Tuke took a walk down the river bank, saw many rocks appearing.

This day fine with passing showers.

30th. Water fell 1 foot 2 inches during night. Daylight opened the right cylinder to clean it, as it had been complaining the last day or two, blew the water out of the boilers; water fell during day 11 inches, ship grounded on earth and a few small patches of slate. We now saw the risk we had escaped, for many rocks had now appeared where the pilots said must be our course, and which appeared to us to be so, and where they were appearing a strong current was running, and had the ship touched there, the consequences might have been serious. This day fine with passing showers, wedged ship up with bazooloos and firewood.

31st. River fell during night 8 inches; 7 A. M., went in sanguttees up the river to whirlpool point, examined reefs, &c., Major Cotton took angles; the information gained by this examination is found in the Journal of 28th.

3 P. M. returned, found tents had arrived; river fell during day 9 inches. A very fine day with light N. W. airs.

August 1st. River fell during night 1 foot 1 inch:—8, started (Major Cotton and Mr. Tuke) on horseback to the rocks at "Goomulcondah," passed through "Mooknoor" village, a very good road for riding: passed 40 or 50 empty bandies which had come from "Nagpoor," having been up there with Government stores, they had been 23 days from "Nagpoor" and expected to be 16 more to "Ellore;" we asked them why they did not load back: their reasons were the heaviness of the roads, and the poor means they had of crossing the river (on sunguttees); we found them encamped, having just arrived, and would march again in afternoon. The writer of the Nagpoor Post Office was travelling down with them en route to Ellore to be married, on 4 months' leave, poor man, his horse had died on the road near "Mahadeopoor;" 10, we stopt in a shady nullah and breakfasted. Noon, pushed on again and arrived at our tent at half past three at a very small village on right bank called "Sintagoomah," 2 miles above "Daunnoor;" at this place all bandies, brinjarries, &c., pass on the river from "Chanda" there were a larger number of the latter crossing while we were there, and we only saw 5 or 6 small sunguttees to perform it all, they pay 2 Rupees for 100 bullocks: at this place the rocks cease, and are said to do so up to "Boree:" we ordered a sunguttee to get ready to take us down the river to steamer next morning. A fine day with calms.

2d. 8, started on 2 sunguttees for "Enchumpillee," for the purpose of seeing the rocks, &c., from here down to the junction of the "Indravatty" river many rocks exist; opposite the village we slept at last night, namely "Sintagoomah," is a rocky point running 40 or 50 yards into the river from 10 to 6 feet in height, a little below which runs another reef lying off shore 200 yards, and running parallel with shore down to an opening in the jungle, where a village is said to have existed, and had been washed away by a fresh; and at the bottom of the opening in the jungle runs another reef off shore, it was attached to bank and was 5 feet high: just below the village of "Sintagoomah" is a large single tree standing 20 yards back from bank, and another one under bank, opposite village, below which 40 yards, is a very large nullah, off which lay several patches of rocks, some of them nearly out as far as mid river, and rocks continue down running out and attached to bank for a good distance, and are of various heights from 10 to 2 feet: half a mile below this village, "Sintagoomah," a reef of rocks extends right across the river, and these are of various heights, some were 6 feet above

water, others a wash; a great rapid running through them all, it was intricate even for our sunguttees: after passing this reef we went over and through much broken water, till we arrived at the "Indravatty" river, where a larger reef, 12 feet high, extended right across the river, with three exceptions; 1st, one passage said to exist close into left bank, 2d, one narrow passage and very crooked through centre, and one close into right bank: the first we had no chance of seeing to give any account of it, as we could not go there in sunguttees; the second we could not go to see for the same reason, but we judged it might have been 50 or 60 yards broad; the third was a passage taking a sweep round the rocks between them and a sand bank attached to right river bank: there is also a patch of rocks 8 feet on this sand bank, which makes the channel intricate; the sand bank was about 6 feet above water level when we were there: the current down this third passage was very great and rapids through the other two; there must be an immense fall from where we slept last night to the bottom of these rocks; we breakfasted on bank under the trees opposite this last and largest reef, the "Indravatty" river now open to us; there appeared to be a reef lying in its centre and one outside its mouth, but a good passage into it, and up as far as we could judge; after breakfast, Major Cotton took angles. Noon started, found a nice clear piece of river free of rocks but a sharp current down to near "Doodiara," where the rocks commence again in patches and reefs of different heights, some 7 or 8 feet above water, but good passage could be made through all as far as rocks are concerned, but the fall must be very great from here down to the "Tarlagoodem" whirlpool. We landed a little below Neelumpully, as the sungedy men did not like to go through the Neelumpully rocks, which are only a continuation of the ones commencing from Doodiara, and extending down to past Tremet, but they are thicker just at "Neelumpully;" but through all these rocks a good passage could soon be made for a steamer as far as the rocks are concerned; the fall in the river is another thing; 4-45, arrived at "Enchumpully" found the ship high and dry; wedged her afresh, but thought she was straining; removing all rocks, slates rather, from under her bottom.

Had a fine hot day, light N. W. airs.

3d. Took water's fall from our standard bamboo, with levelling instrument; found, since we had been here it had fallen 7 feet 10 inches; crew employed pouring water over ship all day, to keep her from opening.

Fine day with squall of wind and rain from N. W. in afternoon. Water fell during day 8 inches.

4th. Water had fallen during night 9 inches; crew wetting ship all day. Water fell during day 7 inches.

Fine with rain and wind N. W. in afternoon.

5th. Water had fallen during night 8 inches; crew employed watering ship.

Water fell during day 7 inches; weather fine, rain in afternoon, winds light from N. W.

6th. River had fallen 9 inches during night; 7, Major Cotton and Mr. Heise, left on sunguttees to go to "Mungapett," there to take paddle boats and proceed to Dowlaiswaram.

Crew employed pouring water over ship. This day heavy rain in the morning with N. W. squall, fine afternoon with light airs.

7th. Water had fallen 5 inches during night; crew wetting ship throughout this day; received a tappal, sent it to Major Cotton. Day fine, with shower of rain at 10 A. M. and little wind; sunset, calm; water fell during day $4\frac{1}{2}$ inches.

8th. Water fell during night 4 inches; crew wetting ship throughout the day, villagers bringing firewood.

Day fine with shower in afternoon, sunset fine; water fell during day 4 inches.

9th. Water fell during night 3 inches; crew wetting ship throughout the day: 3, Mr. Tuke rode down river bank to see the change in river.

Found that from "Gungarum" up to Enchumpully a long continuation of low rocks from 1 to 4 feet had appeared out as far as mid river, leaving the left hand half of river clear of rocks, with the exception of 2 small rocks a quarter of a mile above slate reef point, and 3 small rocks, 3 to 4 feet high lying directly opposite it, and distant from it 100 yards, and half way between "Slate reef Point" and "Tarlagoodem;" a reef was out from left hand bank, being 10 feet at shore and decreasing in height to four feet as its end, which is nearly mid river; opposite Enchumpully a very large reef exists, measuring 14 to 15 feet in height, and 140 yards in length, and 70 broad; there is a passage with a few sunken rocks between it and the left bank, the said passage is 100 yards broad; from Enchumpully upwards the river is studded with rocks of various heights nearly right across, there is a very indifferent channel to be traced through them, but water very shoal; the rocks continue from here up to past "Doodiara," where some are very high, 18 and 20 feet, but with good channels through them; a sketch is added to the journal of this portion of the river. 5-30, returned, found red boat had arrived with 2 men with fever, brought them on shore, and sent 6 lascars of steamer to assist in getting her through the rocks. She crossed over to opposite side; heavy squall during evening and much rain during night, sent to Mahadeopoor; water had fallen 2 inches during day from 2 P. M.

10th. Water had fallen 3 inches during night.

Crew wetting ship all day; observed red boat going slowly up close into left bank.

Fine till noon, then plenty of rain and wind from N. W.

Evening cleared up.

Water had fallen during day 2 inches.

12th. Water fell $1\frac{1}{2}$ inch during night. Daylight Mr. Tuke started for "Mahadeopoor" with 2 elephants, and arrived at Bor "Pulvilla" at 10 A. M.; detained there half an hour for fresh coolies; arrived at "Limkulgudda" at 12 and halted; came upon the river again here for the first time after leaving "Enchumpully." 2-30, started and arrived at "Mahadeopore" at 6-15; after leaving "Limkulgudda" we past through "Wanagoora," Umbulpully, Sooranem and "Ligloor," and many other villages not down in map; at the next village to "Limkulgudda," a distance of $1\frac{1}{2}$ miles, is a magnificent "banyan tree," the only one of any size we had seen; much small teak is to be seen all along the road, the country is a most fertile one, but little cultivation to be seen; even at "Sooranim," where there is a large "Ava" with a masonry sluice at it for watering the low ground under it, which is very extensive, no cultivation worth mentioning exists.

"Mahadeopore" is a very large village compared to all others we have seen, said to contain 5 to 600 houses, inhabitants of all castes, head man of the village is a "Peishcar" on 10 rupees a month, and has no land for cultivation allowed him; the Peishcar was away on leave, but a Patwaree was in charge of the village; he gets no pay, but has land allowed him of the value to him of 10 rupees a month; there is also a Court Naib on 30 rupees a month; there are large "Avas" at "Mahadeopoor" with plenty of water, but still no cultivation beyond enough for the inhabitants' consumption; Mr. Tuke attempted to get a cargo for red boat, but it was a total failure; the Natives saying that 30 rupees worth of articles could not be obtained; no cotton is grown about here, excepting for village consumption. Any quantity required here comes from up-country. There is an old fort in the village but at present uninhabited; before a Rajah lived in it; it is all grown over with grass and in ruins, with a narrow 6-feet deep trench round it; a Mr. Palmer, timber merchant, has a compound with two small bungalows in it, in which he resides 6 months of the year, the other 6 in "Hyderabad"; he is said to have the whole of the teak forests of the Nizam's country, and cuts and sends a great deal to "Hyderabad" on bandies, but all the wood appeared very small; his man left in charge of affairs at his house, said that he was going to send some timber to "Coringa," the size of which was 16 feet long, 1 foot broad, and 8 inches thick, and expected to get 10 to 12 rupees a piece; one log of this description with a piece much smaller he said was a bandy load to "Hyderabad" and that in the best season it was over 5 weeks going to Hyderabad, and in very hot weather 2 months; 2,000 bandy loads are said to start at one time; we saw plenty of his wood at his depot at "Doormoor," but only 3 good logs amongst it all.

His boy offered the services of the bungalows and was very civil. The inhabitants are apparently very comfortably off in this village; all very cleanly clad, and both sexes very healthy strong-looking people, very civil and obliging. There are barbers, dhobies and butchers here, all pretty good in their capacities; sheep, fowls, &c. plentiful, much wild fowl about close to village; no pagodah here. Day fine with calms.

13th. 7, Patwaree and Court Naib came to visit, appeared very respectable men and were very civil; had heard that improvements were to take place in the river Godavery, and were very anxious to know what was to be done, how and when, and really appeared delighted at the idea that their prospects bore a better appearance: they seemed perfectly satisfied to see the change that would take place by boats trading up and down. The nature and uses of the Anicut were explained to them, which rather astonished them; and the immense profits therefore much more so. The "Tushah" silk is made here, but none is on hand; in the bazaar a person requiring any quantity of it would have to give an advance, and wait some time for it to be made. For 3 yards of this silk the Natives asked 14 annas, but I think this was imposition, as it was cheaper at "Mungapett;" the same quantity there being 12 annas. But the great place about here for its manufacture is said to be "Rollapetta Ternagaum," a village 16 miles above "Chinnoor." This day very hot, fine weather with no wind.

14th. 11, left on the elephants for "Chinnoor;" 2, arrived at a village at the branching off of the Godavery and Wurdah rivers, called "Kowlaisweram," it is situated a quarter of a mile from river bank on rising ground; there are several pagodahs in village and one close to river; there is a fort also, which is inhabited by a whealthy Teloogoo man—there is a large tank at this village on the high ground with a masonry sluice in it; but no cultivation to speak of in neighbourhood, although plenty of fine looking land all about: our road was through a thickly-wooded jungle, but the road pretty good; at 4, arrived at and crossed the "Godavery," or as it is called by the native "Gungah;" there are two large sunguttees for the ferry, the name of the village at which you cross is "Pulgoolah," it has only 4 houses in it, the river narrow here, 400 yards, and has a small rocky island with 4 trees and some small bushes on it; directly mid river and opposite the village just named, the bank under village, and for a quarter of a mile above it, has many rocks attached and running out 40 to 50 yards, the river with these exceptions as far as could be seen was clear of rocks, but with large sank banks; the height of the highest part of rocky islands was 14 feet above water level and the rocks about bank 12 and 13 feet high, all sand stone; alligators said to be very numerous about here; there was a current of 2 miles an hour running down the river when we crossed, and 15 and 16 feet deep at least; we had to swim the elephants

across, the breadth of water was 90 yards; after crossing we went over a large plain very gradually and slowly sloping up to village of Chinnoor, which is 1½ mile from river; this plain is of vast extent with patches of cultivation here and there, many cattle in this neighbourhood, the road over plain was pretty tolerable; at 6 P. M. we arrived at "Chinnoor." There are 2 "Avas" at this village, and many smaller tanks. There are pagodahs in village, and 150 sepoys and native officer of this village. More shall be said in continuation of this Journal kept by.

(Signed) G. P. TUKE,

Dowlaiswaram, 1st October 1853. *Commanding Pottinger.*

"POTTINGER'S" JOURNAL DOWN THE RIVER.

On Thursday September 6th, at 9 A. M. started, with iron boat in tow, for "Dowlaiswaram;" (the Pottinger having floated off the rocks Wednesday August 24th) soon came to the place where the whirlpools are said to exist, "or Tarlagoodem;" saw broken water close under the village of Tarlagoodem extending out 80 or 90 yards from bank; this it would appear must have been caused in some manner by the rocks mentioned in previous part of this journal as wall C, and marked C in sketch No. 1, although these rocks must have been far under water; on this day the river being very full the length of broken water appeared to be 60 or 70 yards, by 20 or 30 broad, and running parallel with bank; on the opposite side at the point A where the great whirl is said to exist, a very strong race set off at a good angle, and ran out from 150 to 200 yards into the river, behind which race there appeared much curling water, and waves of from 3 to 4 feet high; it appeared like boiling water, and there were evidently very powerful eddies in it; from appearance a small boat would have been swamped, although it would be almost an impossibility for a boat coming down the river to get into it, as from the immense strength of the race, she would be carried down it, and not over it into the curling water; the passage between this race and the broken water under Tarlagoodem was without a ripple, and as broad and safe as could be wished for; the sketch No. 3 is intended to show the race, broken water &c., and the Pottinger's course through. Nothing worthy of notice took place in the run down to "Dumgoorem" (80 miles); when the Pottinger arrived at a quarter to six P. M., found Major Cotton, Captain Hutchinson and Mr. Walker in a small steamer, built and fitted up in the Dowlaiswaram workshop, lying in and made fast to the bank, ran in and made fast also, found that they had broken their little vessel's main shaft; put

the fires out for the night. It should here be remarked that the Pottinger's course will be shown in a map which is being made, all rocks in the river were covered. The day fine with one or two light passing showers. Wednesday 7th at 6-30 started, with small steamer and iron boat in tow, for "Badrachellum;" observed much troubled water at the point (and extending out from it into river 2 to 300 yards) at "Duntanum," a village opposite "Gollagoodum," arrived at "Badrachellum" at 7-53 A. M., made fast to the bank, Major Cotton landed. 12-15, again started for "Dowlaiswaram," passed the village of "Dewarapillee" where a bad whirl is said to form in the freshes, but all appeared quiet there; 2-15 arrived at "Roodrumkota," stopt there to take on board the head man of village, he wishing to go to "Dowlaiswaram" in the Steamer. 2-55 started, about 4, came to the village of "Kooloor" at the entrance of the gorge, another reported place for whirlpools; found strong currents or sets off points and very strong eddies; the "Pottinger" was turned quite round by one of the latter, but afterwards passed many others of the same description in the gorge, but great attention being paid to the helm, she came through all without any difficulty; soon came to Swhagirry, where a very powerful race sets into river 100 yards or so; and directly opposite this, on the other side of river, another strong current runs off a rocky point and has very strong eddies behind it; mid channel should be kept at this part of the river in the freshes, (if pretty high) but it will be seen in a report sent to Major Cotton sometime ago by Mr. Tuke, that a large rock stands nearly mid river just at this place, which no doubt will be beaconed some day; 6, arrived at "Taykoor," made fast to the bank, put the fires out; day fine with a squall of rain and wind at 3 in the afternoon.

Thursday 8th. Morning employed woodding steamer; Major Cotton, Captain Hutchinson and Mr. Walker started and walked down to see the state of the river at Kutchuloor, where they had found much broken water, whirls, &c. on their way up in small steamer; about 11 A. M. they returned, determined to stay the day where we were, and start the next day; day fine, with calms.

Friday 9th. 8, lighted the fires, got steam up; 9-50 started and arrived at the place, or rather a little above of the whirls, made fast to the bank, walked down to see it; on arriving there, found the water in strange commotion, now throwing up waves, then quiet and smooth again: forming troughs, holes, whirls, sometimes in this place, and then in another, and in fact appeared behaving in a most eccentric manner; but did not appear as though it would prove actually dangerous to any thing but a very small boat, which might be swamped by a wave curling into sea, but this is only a surmise; after looking and looking for some time at all that was going on, we sent for the little steamer, and she came dropping down with ropes, to the point A on which we were standing

(the Taykoor or right bank of river) and having laid warps out, hauled her round against a strong back current running up the river; made her fast to the bank, and went back for Pottinger and "red boat;" shoved off and came to the point A, keeping pretty close to it, went round without any difficulty, we kept rather farther off than the small steamer was, when she went round, and evidently had less current, picked up the little steamer, and at 4-50 started for "Gootalah," where we arrived at 6-30, landed our peon Chittiah, and started immediately for "Dowlaiswaram" where we arrived at 9-15 P. M.; moored ship in the Boomoor channel with S. B. and B. B., put the fires out; Civil Engineer landed; and then ends the Pottinger's journal—which vessel, it may be here remarked, did not suffer a rupee's worth of damage, by having been high and dry on the rocks for 23 days, during which time all that could be done for her was to pour water over her hourly; she floated off again, and did not make a bucket of water, and she steered and steamed as well as ever she did.

(Signed) G. P. TUKE,

Dowlaiswaram, 1st October 1853. *Commanding Pottinger.*

(True copies)

FRED. C. COTTON, Major,

Civil Engineer, G. Dn.

TAMIL NADU ARCHIVES, MADRAS-600 008
No. 15783

1056

Aneroid Observations taken in Godavery River.

Date.	Hour.	Place taken at.	No. 1, Aneroid.	No. 1, Ther.	No. 2, Aneroid.	No. 2, Ther.	No. 3, Aneroid.	No. 3, Ther.
June 28th	3-30 P. M.	Off " Gootallah" on " Pottinger's" deck......	29- 3	91	29-325	90	29- 36	92
20th	1-5 P. M.	Off " Koratoor" on deck......	29- 350	88	29-375	$89\frac{1}{2}$	29-352	90
	3-30 P. M.	Near " Peyrentapillee" in cabin......	29-3125	87	29- 35	$88\frac{1}{2}$	29- 33	$88\frac{1}{2}$
	6 P. M.	Near " Koyenday" on deck......	29-3125	87	29- 35	88	29- 33	88
30th	6-30 A. M.	At " Koyenday" on deck......	29- 38	83	29- 4	84	29- 39	$84\frac{1}{2}$
	10-15 A. M.	At " Koyenday" in cabin......	29- 4	83	29- 43	85	29- 4	85
	4-30 P. M.	At " Koyenday" in cabin......	29- 32	86	29- 35	87	29-325	$87\frac{1}{2}$
July 1st	8 A. M.	Off " Kotalagoomee" on deck......	29- 38	$80\frac{1}{3}$	29-425	83	29-370	82
	3 P. M.	" Sokunpully" on deck......	29- 32	$91\frac{1}{2}$	29- 32	94	29- 35	95
	5-30 P. M.	Off " Woddagoodium" on deck......	29-325	93	29- 3	93	29-325	$93\frac{1}{2}$
2d	6-40 A. M.	At " Roodrumkota" in cabin......	29- 35	82	29- 35	84	29: 33	84
	10-15 A. M.	At " Konaram" at mouth of Seppry river on deck...	29- 4	85	29- 4	85	29- 38	84
	5 P. M.	Off " Ramachendraporam" on deck......	29-325	83	29- 34	84	29- 3	84

Date.	Hour	Place taken at.	No. 1, Aneroid.	No. 1, Ther.	No. 2, Aneroid.	No. 2, Ther.	No. 3, Aneroid.	No. 3, Ther.
July 3d	7-30 A. M.	In Seppry river on deck	29- 45	83	29- 45	84	29- 43	84½
	2-10 P. M.	do do do	29- 38	87	29- 37	87½	29- 37	88
	4-45 P. M.	do do do	29- 38	90	29- 36	90	29- 36	90
	7 P. M.	do do do	29- 4	88	29- 37	89	29- 37	89
4th	7-30 A. M.	Off "Ramachendraporam" on deck	29-425	83	29-425	83¼	29- 4	84
	10-10 A. M.	Off "Goomodoodium" pagodah on deck	29-412	82	29-412	83	29- 38	83
	12-45 P. M.	At "Poatla" 1½ mile above "Goomodoodium" pagodah on deck	29- 36	87	29- 37	87	29- 35	87
	5 P. M.	Off "Kasaram" a little above "Poatla" on deck	29- 28	87	29- 28	88	29- 27	89
5th	6-20 A. M.	"Kondapullee" on deck	29- 33	83	29- 35	84	29- 38	85
	1-30 P. M.	Off "Madaram" on deck	29-325	82	29- 35	84	29- 32	84
	4-5 P. M.	Off "Polalam" on deck	29- 27	85	29- 3	85	29- 29	85
6th	6-45 A. M.	"Goompanapillee" in cabin	29-325	82	29- 35	83	29-312	83
	2 P. M.	Near "Budrachellum" in cabin	29- 28	84	29-325	85	29- 28	85
7th	7-20 A. M.	"Budrachellum" on deck	29- 37	81½	29- 38	83	29-36	84

8th	7 A. M.	"Budrachellum" on deck	29- 4	82	29-412	83	29- 37	83
	4-20 P. M.	do do	29- 3	89	29-312	89	29- 3	89
	6 P. M.	do do	29- 3	89	29-312	89	29- 3	90
9th	8-40 A. M.	"Budrachellum" in cabin	29- 36	81	29- 37	83	29- 57	83
	2 P. M.	Off "Moothair" on deck	29- 27	81½	29-325	83	29- 28	83
	5-20 P. M.	Opposite "Nellepak" on deck	29- 32	82½	29- 25	83	29-225	84
	6 20 P. M.	"Duntanum" on deck	29- 24	83	29- 28	84	29- 24	84½
10th	7-30 A. M.	Off "Chintraala" on deck	29- 26	81	29-325	83	29- 26	83
	1-10 P. M.	"Doomagoorem" in cabin	29- 26	86	29- 28	86	29- 26	87
11th	8-15 A. M.	"Doomagoorem" on deck	29- 25	81	29- 28	82½	29- 23	83
	3-40 P. M.	"Ameragurrapillee" opposite "Doomagoorem" in cabin	29- 2	81	29- 25	83	29- 2	83
	5 P. M.	"Doomagoorem" in cabin	29- 2	81	29- 25	83	29- 2	83
12th	Noon.	"Doomagoorem" in cabin	29- 2	80	29- 25	82	29- 19	82
13th	11 A. M.	"Kothagoodem" between "Doomagoorem" and "Parnasala" on deck	29-212	85	29-275	86	29- 29	86
	3 P. M.	"Parnasala" on deck	29- 13	85	29- 17	86	29- 15	86

Date.	Hour.	Place taken at.	No. 1, Aneroid.	No. 1, Ther.	No. 2, Aneroid.	No. 2, Ther.	No. 3, Aneroid.	No. 3, Ther.
July 14th	6 A. M.	" Unarum" on deck	29- 22	81½	29-275	83	29- 22	83
	4 P. M.	Opposite " Bristagoodem" on deck	29- 18	87	29- .2	87	29-175	87½
15th	6 A. M.	" Palebenapully" on deck	29- 25	83	29- 27	84	29- 25	85
	1 P. M.	do do	29- 22	89	29- 24	89	29- 22	90
	½ p. 6 P. M.	" Bunhagoorem" on deck	29- 22	92	29- 29	93	29- 23	94
16th	8-15 A. M.	" Idraree" on deck	29- 23	82	29- 28	84	29- 25	85
17th	6 A. M.	" Soroor" on deck	29- 22	79½	29- 27	83	29- 22	81
	5-45 P. M.	do do.	29- 27	81	29-325	83	29- 27	83
18th	5-40 A. M.	" Soroor" on deck	29- 25	78	29- 32	81	29- 25	80
	11-30 A. M.	do do	29- 27	81	29- 32	83	29- 27	83
19th	7 A. M.	" Soroor" on deck	29- 27	81	29- 32	82	29- 27	82
	5 P. M.	" Kotagoodum" opposite " Soroor"	29- 2	90	29- 22	91	29- 22	91

20th	Noon.	" Wuddagoora" on deck	29- 18	83	29- 23	85	29- 18	85
	4-45 P. M.	Near " Chinsopullee" on deck	29- 2	88	29- 18	90	29- 16	91
21st	2-30 P. M.	" Chinsopullee" on deck	29- 17	80	29- 22	82	29- 17	82
22d	9 A. M.	" Ankarakoodem" near " Albaka" in cabin	29- 22	79	29- 28	81	29- 22	80
	5 P. M.	" Nullagoontapully" on deck	29- 22	80	29- 27	82	29- 22	80
23d	10 A. M.	" Mungapett" on deck	29- 27	80	29- 32	81	29- 27	81
	4 P. M.	do do	29- 25	79	29-312	80	29- 25	80
24th	11 A. M.	" Mungapett" in tent on bank	29- 25	84	29- 28	85	29- 25	86
	4 P. M.	do do do	29- 27	86	29-312	88	29- 27	87
25th	8 A. M.	" Mungapett" in tent on bank	29- 3	86	29- 34	88	29-312	89
	6 P. M.	Near " Nagaram" on deck	29- 22	86	29- 27	87	29- 23	87
26th	6-30 A. M.	" Nuggarum" on deck	29-312	83	29- 35	85	29-312	85
	5 P. M.	Opposite " Poosoor" on deck	29-325	85	29- 38	87	29- 32	86
27th	6-30 A. M.	Opposite " Poosoor" on deck	29- 34	82½	29- 37	84	29- 34	85
	1-30 P. M.	" Wanajoora" on deck	29-312	85	29- 35	85	29-312	86

Date.	Hour.	Place taken at.	No. 1, Aneroid.	No. 1, Ther.	No. 2, Aneroid.	No. 2, Ther.	No. 3, Aneroid.	No. 1, Ther.
July 28th	6-45 A. M. 4-30 P. M.	"Lutchmeporam" 1½ mile above "Goodroola" on deck..... Near "Tremet" on deck.....	29- 36 29- 34	85 87	29- 35 29- 33	85 88	29·325 29- 34	86 88
29th	6 A. M. 6 P. M.	"Enchumpully" on deck..... do do	29-312 29-325	83 87	29- 34 29- 35	84¼ 88	29-312 29-325	85 89
30th	6-15 A. M. 4-30 P. M.	"Enchumpully" on deck..... do do	29-312 29- 32	85 87	29-350 29- 37	86 88	29-312 29- 32	87 88½
31st	7 A. M.	"Enchumpully" on deck.....	29- 28	82	29- 35	84	29- 28	84
August 1st	.....	Absent at "Goomulconda".....	.....	.....	.....	.....	.....	.....
2d	.....	Absent at "Goomulcoonda".....	.....	.....	.....	.....	.....	.....
3d	Noon	"Enchumpully" in tent.....	29- 2	87	29- 22	89	29- 22	89

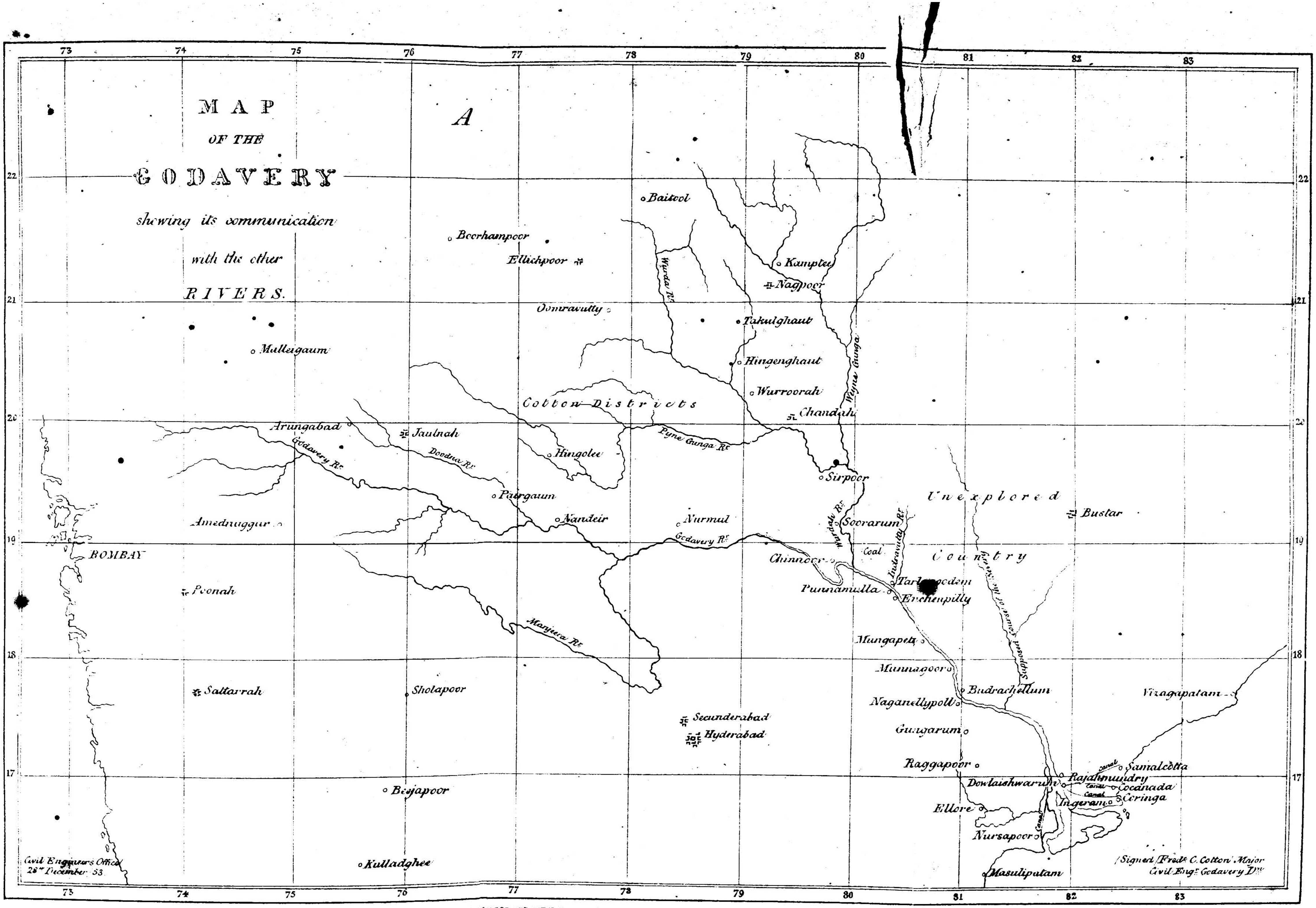
4th	2 P. M.	"Enchumpully" in tent	29·21	87	29·22	88	29·21	89
5th	Noon	"Enchumpully" in tent	29· 2	86	29·21	87	29·22	88
6th	11 A. M.	"Enchumpully" in tent on bank	29·22	81	29· 3	82	29·24	82
	7 P. M.	do do do	29· 2	85	29·25	87	29· 2	87
7th	7-30 A. M.	"Enchumpully" in tent on bank	29·22	80	29· 3	81	29·22	82
	6-30 P. M.	do do do	29·18	86	29·25	88	29·19	89
8th	7-30 A. M.	"Enchumpully" in tent on bank	29·22	79	29·29	80	29·22	81
	11 A. M.	do do do	29·25	83	29· 3	85	29·26	85
	3 P. M.	do do do	29· 2	87	29·25	88½	29·21	89
9th	7 A. M.	"Enchumpully" in tent on bank	29· 2	79	29·27	80	29· 2	81
	1 P. M.	do do do	29·22	87	29·26	87	29·23	88
10th	6-45 A. M.	"Enchumpully" in tent on bank	29·18	77	29·25	79	29·18	79
	Noon	do do do	29· 2	81	29·25	83	29· 2	84
	6 P. M.	do do do	29·18	82	29·22	84	29·18	85

Date.	Hour.	Place taken at.	No. 1, Aneroid.	No. 1, Ther.	No. 2, Aneroid.	No. 2, Ther.	No. 3, Aneroid.	No. 3, Ther.
August 11th	7 A. M.	"Enchumpully" in tent on bank	29- 2	83	29-25	85	29- 2	86
	Noon	do do do	29- 19	85	29-27	87	29-19	88
	6 P. M.	do do do	29- 18	86	29-20	88	29-18	89
12th		The Aneroids Nos. 2 and 3 have been very irregular, some days 2, much higher and lower than 3 and vice versa.						
Sunday 21st	10 A. M.	"Enchumpully" in tent	29-21	85	29-28	86	29-21	87
	2 P. M.	do do	29- 2	84	29-27	85	29- 2	86
22d	10 A. M.	"Enchumpully" in tent	29- 2	82	29-27	83	29- 2	84
	1 P. M.	do do	29-18	83	29-25	84	29-28	85
23d	9 A. M.	"Enchumpully" in tent	29-19	84	29-26	85	29-19	86
	3 P. M.	do do	29- 2	85	29-27	86	29- 2	87
24th	10 A. M.	"Enchumpully" in tent	29- 2	84	29-27	85	29- 2	86
	3 P. M.	do do	22-21	83	29-28	84	29-21	85

25th	11 A. M. 1 P. M.	"Enchumpully" in tent......... do do	29- 2 29- 2	83 85	29-27 29-27	84 86	29- 2 29- 2	85 87
26th	10 A. M. 4 P. M.	"Enchumpully" in tent......... do do	29-22 29-21	84 85	29-29 29-28	85 86	29-22 29-21	86 87
27th	10 A. M. 5 P. M.	"Enchumpully" in tent......... do do	29-19 29-17	82 80	29-26 29-24	83 81	29-19 29-17	84 82
28th	Noon 5 P. M.	"Enchumpully" in tent......... do do	29- 1 29- 1	80 80	29-17 29-17	81 81	29- 1 29- 1	82 82
29th	8 A. M. 4 P. M.	"Enchumpully" in tent......... do do	29- 1 29-12	78 80	29-17 29-19	79 81	29- 1 29-12	80 82
30th	9 A. M. 3 P. M.	"Enchumpully" in tent......... do do	29- 1 29- 1	79 80	29-17 29-17	80 81	29- 1 29-17	81 82
31st	10 A. M. 4 P. M.	"Enchumpully" in Pottinger's cabin......... do do do	29- 1 29-11	80 82	29-18 29-18	81 83	29- 1 29-11	82 84
Septr. 1st	9 A. M. 3 P. M.	"Enchumpully" in Pottinger's cabin......... do do do	29-15 29-14	81 82	29-21 29- 2	82 83	29-15 29-14	83 84

Date.	Hour.	Place taken at.	No. 1, Aneroid.	No. 1, Ther.	No. 2, Aneroid.	No .2, Ther.	No 3, Aneroid.	No 3, Ther.
Septr. 2d	9 A. M.	"Enchumpully" in Pottinger's cabin	29-14	82	29- 2	83	29-14	84
	4 P. M.	do do do	29-18	83	29-24	84	29-18	85
3d	10 A. M.	"Enchumpully" in Pottinger's cabin	29- 2	81	29-26	83	29- 2	84
	4 P. M.	do do do	29- 2	82	29-26	84	29- 2	85
4th	Noon.	"Enchumpully" in Pottinger's cabin	29- 2	82	29-26	83½	29- 2	84
5th	3 P. M.	"Enchumpully" in Pottinger's cabin	29-21	84	29-27	85	29-22	86
6th	8 [illegible]	"Enchumpully" in Pottinger's cabin	29-25	80	29-31	81½	29-25	82
7th	[illegible] M	Near the gorge	29- 4	85	29-45	87	29- 4	88
[illegible]	9 A. M.	At "Taykoor"	29- 5	84	29-51	85	29- 5	86
9th	8 A. M.	At "Taykoor"	29-48	82	29- 5	83	29-48	86

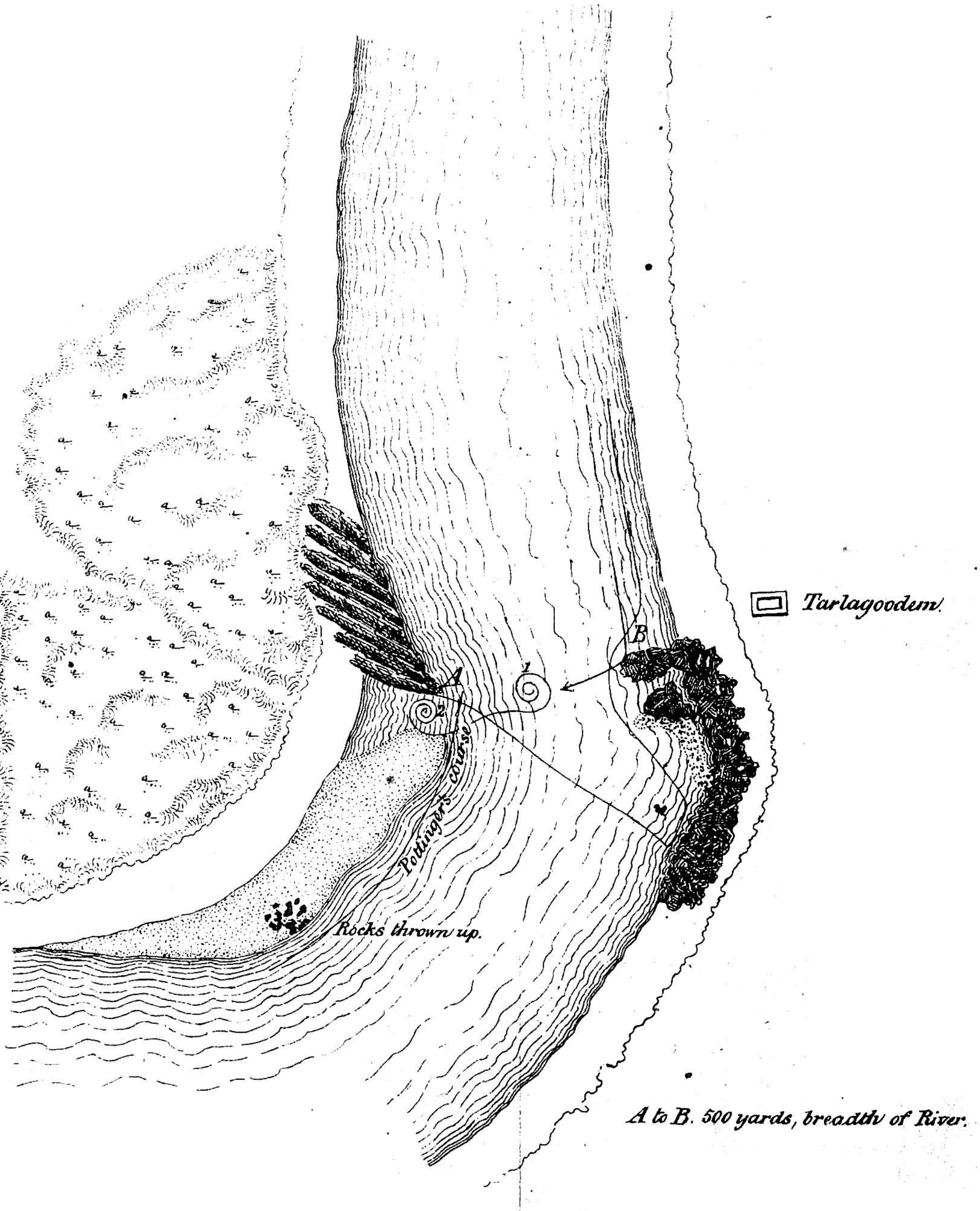
GEORGE PLEYDELL TUKE, *Commanding Pottinger.*



ON TRANSFER PAPER BY H. ACALDER AND LITHd BY J. DUMPHY, GOVT. LITHC PRESS, CENTRAL OFFICE OF PUBLIC WORKS, FORT ST GEORGE

Sketch

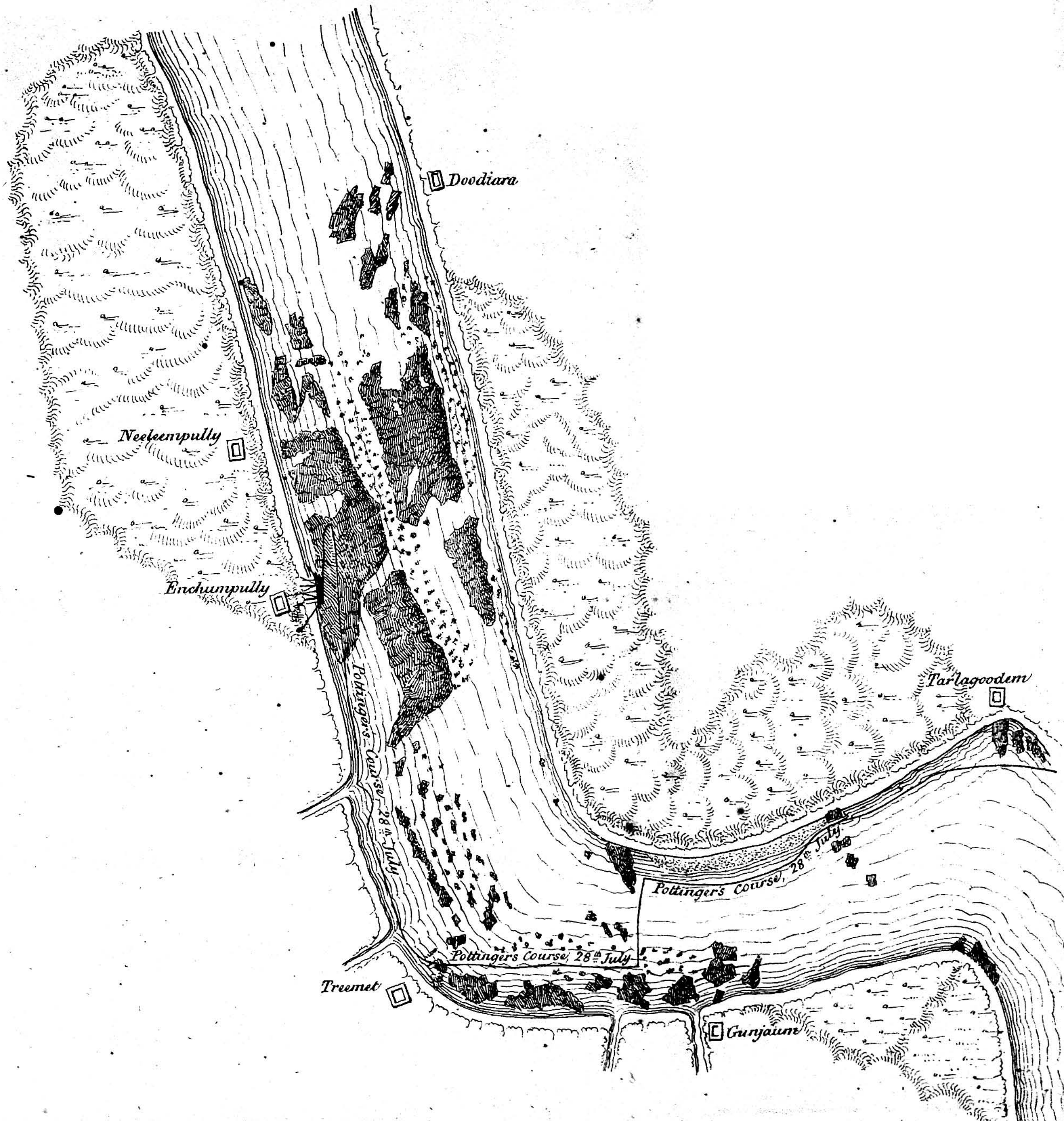
of the whirlpools called
by
CAPTAIN FENWICK
Mooknoor,
but are properly
TARLACOODEM WHIRLPOOLS,
said to exist when the River is very full.



This sketch is copied from one made by G. P. Tuke Esquire, Commanding Pottinger, and is intended to point out the positions of the Whirls when the River is very full._ The River was low when this was taken, and no Whirls existing.

ON TRANSFER PAPER BY H. R. CALDER. LITH° BY J. DUMPHY. GOV^T LITH^C PRESS. CENTRAL OFFICE of P. W. FORT. S^T GEORGE.

Sketch taken on the 9th August.



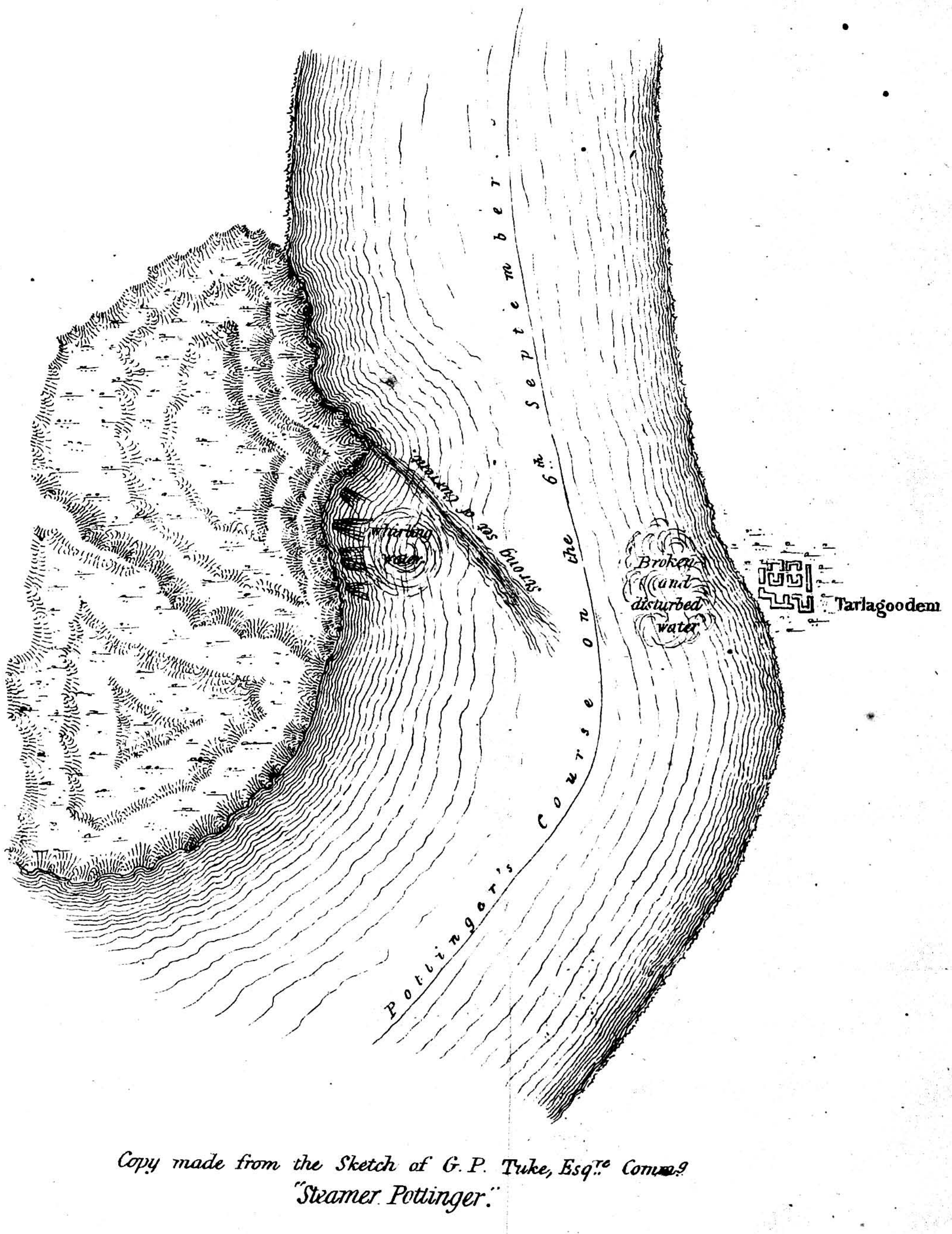
Copy made from the Sketch of G. P. Tuke Esqre
Commanding Steamer Pottinger.

Sketch

intended to point out the place
of the

TARLAGOODEM WHIRLPOOL,

as it appeared on the 6th Septr /53.
when the River was very full.



Copy made from the Sketch of G. P. Tuke, Esqre Commg
"Steamer Pottinger."

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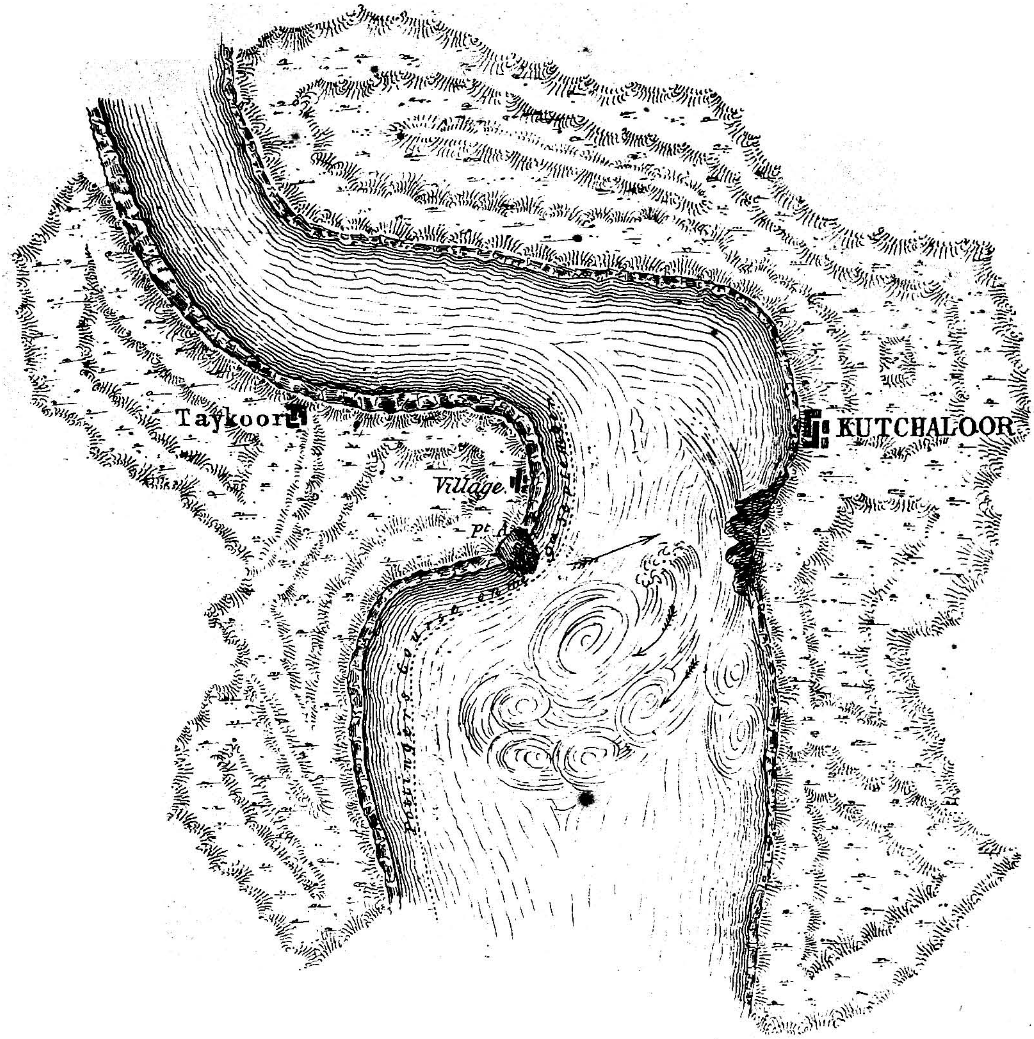

Whirls at "KUTCHALOOR" as they appeared on the 9th Sept.r
from a sketch of the Com.r of the "Pottinger."

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